September 22nd, 2023 08:00 - 09:00

POSTER WALK – BRAIN 4

ID 99. LANGUAGE OUTCOMES AT 4-YEARS OF LINGUISTICALLY DIVERSE CHILDREN BORN VERY PRETERM: AN AUSTRALIAN RETROSPECTIVE SINGLE CENTRE STUDY

Doctor Giannina Tinoco Mendoza[1,5], Doctor Jacqueline Stack[2,5], Professor Abdel-Latif Mohamed[3,6,7], Associate Professor Shanti Raman[4,5], Doctor Pankaj Garg[4,5]
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Background: Very preterm children are at increased risk of language delays. Concerns have been raised about the utility of English-based language tools to diagnose language delay in linguistically diverse children. Our study investigated the prevalence of language delays at 4-years in linguistically diverse very preterm children.

Methods: This was a retrospective review of very preterm children (<30 weeks gestation) born in South Western Sydney (Australia) between 2012 and 2016, who were followed-up in our neurodevelopmental follow-up clinic. The primary outcome was prevalence of language delay at 4-years using the Clinical Evaluation of

Language Fundamentals Preschool–2 (CELF–P2) assessment tool. A secondary outcome was to explore predictors associated with language delays and lower language scores on the CELF–P2 tool at 4 years.

Results: 160 very preterm children attended the 4–year assessment out of the included 270 long–term survivors. At 4 years, 76 (52%) of our very preterm children had language delays diagnosed using the CELF–P2 assessment tool. Children were divided into those that preferred English language (128 out of 217) and those that preferred a language other than English (32 out of 53), depending on parental preference. Children that preferred a language other than English had lower average core language scores on the CELF–P2 assessment tool (75.1 ± 14.4) compared to children that preferred English language (86.5 ± 17.9) (p 0.002). Very preterm children growing up in households that preferenced a language other than English and those who were born from multiple births had higher odds of language delays at 4 years (AOR 10.30 (95% CI 2.82–38.28); p<0.001, and AOR 2.93 (95% CI 1.20–7.14); p 0.018, respectively). Assessing these children using an English–based language tool may have affected language scores at 4 years.

Conclusion: In this metropolitan setting, very preterm children from linguistically diverse backgrounds were found to be vulnerable to language delays at 4 years. Further large–scale studies evaluating the language outcomes of linguistically diverse preterm children with more culturally appropriate tools are warranted. We question the utility of English–based language tools to assess language outcomes of linguistically diverse populations.

Characteristic	Preferred language English (n = 128)	Preferred language other than English (n = 32)	OR (95% CI); p-value
Age at assessment (months)	47.5 ± 2.4	47.4 ± 3.0	0.97 (0.81-1.17); 0.762
Core language scores CELF-P2 [a]	**n = 119**	**n = 27**	
None (score ≥ 86)	65 (54.6)	5 (18.5)	**0.19 (0.07-0.53); 0.002**
Mild (score 78-85)	16 (13.4)	5 (18.5)	1.46 (0.49-4.42); 0.500
Moderate (score 71-77)	17 (14.3)	7 (25.9)	2.10 (0.77-5.72); 0.147
Severe (score ≤ 70)	21 (17.6)	10 (37.0)	**2.75 (1.10-6.84);0.030**
Any level of language delay	54 (45.4)	22 (81.5)	**5.30 (1.88-14.92); 0.002**
Male gender	69 (53.9)	20 (62.5)	1.43 (0.64-3.16); 0.383
Multiple pregnancy	36 (28.1)	7 (21.9)	.72 (0.28-1.80); 0.477
Gestational age, week **<27 weeks**	27.6 ± 1.7 46 (35.9)	27.0 ± 1.7 15 (46.9)	0.83 (0.66-1.04); 0.099 1.57 (0.72-3.44); 0.257
Proven infection **-late onset systemic bacteraemia** **-confirmed meningitis**	 15 (11.7) 1 (0.8)	 3 (9.4) 0 (0)	 0.78 (0.21-2.87); 0.708 -
Intraventricular haemorrhage grade 3 or 4 or PVL	3 (2.6)	1 (3.7)	1.46 (0.15-14.62);0.747
Necrotizing enterocolitis	5 (3.9)	2 (6.3)	1.64 (0.30-8.87); 0.566
Chronic lung disease	45 (35.2)	10 (31.3)	0.84 (0.37-1.92); 0.678
Retinopathy of prematurity requiring surgery	9 (7.0)	1 (3.1)	0.43 (0.05-3.50); 0.427
Cerebral palsy requiring walking aids (GMFCS ≥ 3)	0	2 (6.3)	-
Blindness Bilateral Unilateral	 0 1 (0.8)	 0 0	 - -
Hearing loss Hearing aids required Cochlear implants required	 1 (0.8) 1 (0.8)	 0 0	 - -

Data are presented as n (%) or mean ± SD, and crude OR; 95% CI. Preferred language English was set as a referent for odds ratio and 95% CI calculation. CI denotes confidence interval; GMFCS, denotes gross motor function classification system; OR, odd ratio; PVL, periventricular leukomalacia and SD standard deviation. [a] Twelve children out of the 160 attending the 4-year assessment were unable to complete the CELF-P2 assessment for different reasons.

Table 1: Language outcomes, perinatal characteristics, major neonatal morbidities and neurodevelopmental outcomes among children born 23 to 30 weeks gestation and assessed at 4 years

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None declared

ID 50. Effectiveness of a probiotic combination on the neurodevelopment of the very premature infant

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Background: Probiotics, especially in combination, have proven to be beneficial in the incidence of necrotising enterocolitis in premature infants less than 32 weeks gestational age and less than 1,500g birth weight. However, the study of their effect on premature infants' neurodevelopment is limited. The aim of our study was to elucidate whether the effect of Bifidobacterium bifidum NCDO 2203 combined with Lactobacillus acidophilus NCDO 1748 could positively impact the neurodevelopment of the premature infant.

Methods: Experimental study with a combined treatment of probiotics in premature infants <32 weeks and <1,500g birth weight, cared for at a level III neonatal unit between January 2014 and December 2019. Until the end of 2016, the probiotic combination was administered orally to neonates surviving beyond 7 days of life, until 34 weeks postmenstrual age or discharge. Globally, neurodevelopment was evaluated at 24 months corrected age.

Results: A total of 233 neonates were recruited, 109 in the probiotic group and 124 in the non-probiotic group. In those neonates receiving probiotics, there was a

significant reduction in neurodevelopment impairment at 2 years of age RR=0.30[0.16–0.58], with a sustained reduction in the degree of impairment (normal–mild vs moderate–severe, RR=0.22[0.07–0.73]). There was also a significant reduction in late–onset sepsis (RR 0.45[0.21–0.99]) and days of intensive care (9[6–15]vs14[7–41.5]) (p<0.001). There was no significant reduction in necrotising enterocolitis, death or intraventricular haemorrhage.

Conclusions: The prophylactic use of this probiotic combination contributed to improving neurodevelopmental outcome and reduced sepsis in neonates born at <32 weeks and <1,500 g.

	Probiotics	No Probiotics	Relative risk [95% CI]	χ^2	p-value
Neurodevelopment at 2 years					P<0.001*
Normal	76/86	63/101			
Mild impairment	7/86	22/101	0.37 [0.17-0.83]	6.59	p=0.0159*
Moderate impairment	2/86	11/101	0.21 [0.05-0.94]	5.27	p=0.0407*
Severe impairment	1/86	5/101	0.24 [0.03-1.97]	2.15	p=0.1821
Normal vs impaired			0.30 [0.16-0.58]	16.45	p=0.0003*
Normal-mild vs moderate-severe			0.22 [0.07-0.73]	7.77	p=0.0013*
Bayley-III					
Mental	99 (95-104)	95 (85-105)			p=0.244
Motor	97 (91-103)	97 (85-107)			p=0.323
Language	94 (89-100)	88.5 (77-97)			p=0.006*

*Statistical significance

Neurodevelopmental outcomes at the 2–year analysis.

Neurodevelopmental outcomes at the 2–year analysis.

None declared

ID 777. BRAIN NETWORK DEVELOPMENT IN EXTREMELY PRETERM BORN INFANTS

Doctor Bauke Van Der Velde[1], Xiaowan Wang[1], Doctor Sandra van der Salm[2], Nizare Henriquez[2], Professor Manon Benders[1], Dr Maria Luisa Tataranno[1]

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Background

Extremely preterm infants spend much of their development in the NICU, where the high number of stressors can severely impact brain development. This is particularly true for brain connectivity, which develops early in life through brain activity caused by sensory stimulation. The exact mechanisms underlying the development of brain connectivity in this population are poorly understood, due to the challenges of longitudinally tracking brain development. A better understanding of this process could give us new handles to earlier predict future outcomes. Therefore, this study aims to describe brain network development in extremely preterm infants.

Methods

We prospectively included 32 extremely preterm infants who underwent biweekly multi-channel EEG recordings from birth to term age. For each EEG recording, we created brain networks using the phase lag index for delta, beta, and low and high gamma frequency bands. Network strength and small-worldness (SW) were calculated as measures of network maturation. Linear mixed effect models were used to describe the relationship between brain network characteristics and corrected postnatal age (CPA) with participant and morphine dose as random effects.

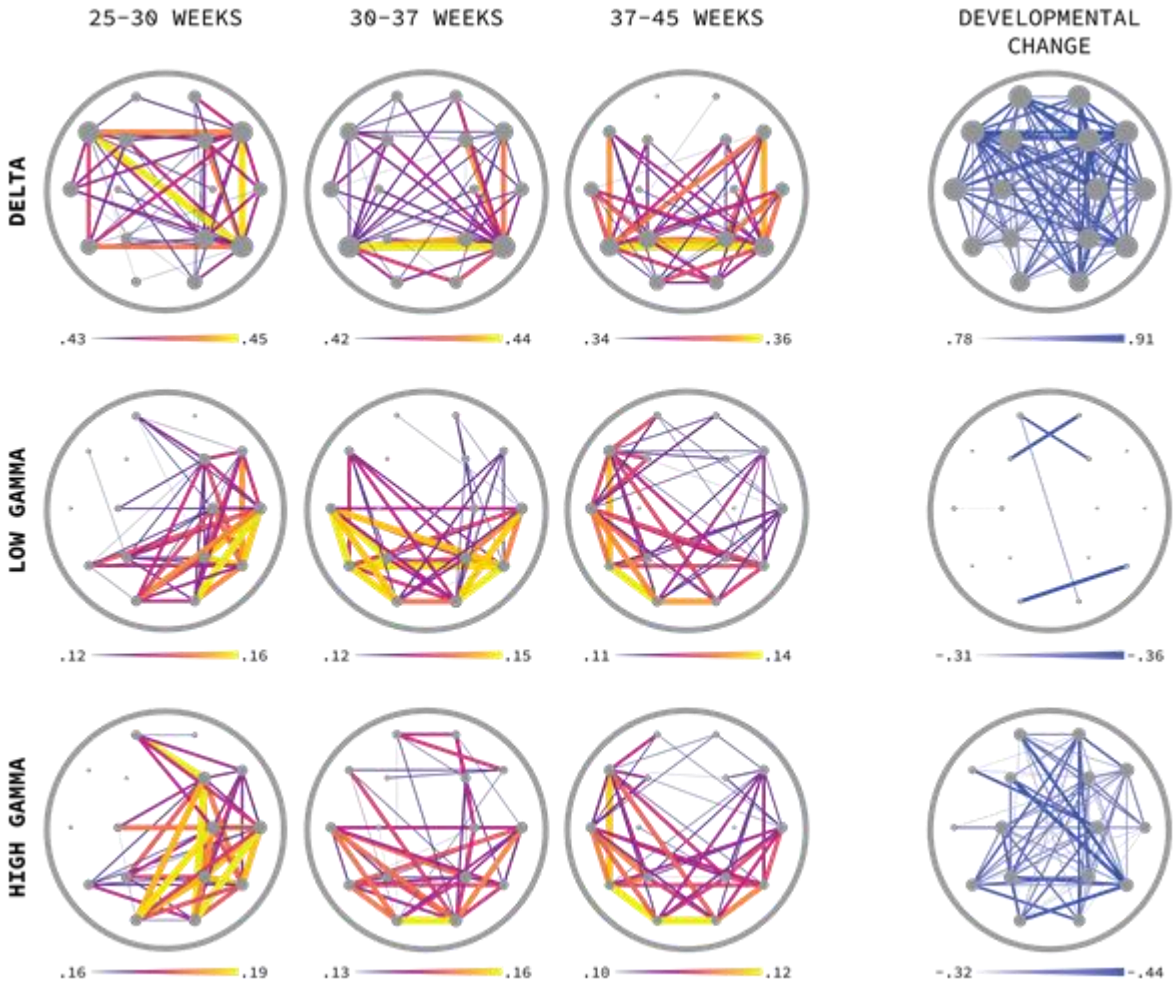
Additionally, we determined the feasibility of using these measures to predict future outcomes by calculating their stability over measurements.

Results

CPA was found to be strongly negatively related to delta network strength ($\beta=-0.89$, $p<0.001$). Conversely, delta SW increased with CPA ($\beta=0.24$, $p<0.05$). For the high gamma network, both network strength ($\beta=-0.42$, $p<0.001$) and SW decreased with CPA ($\beta=-0.36$, $p<0.01$). Additionally, both delta strength (r: 0.41–0.51) and high gamma strength (r: 0.68–0.76) showed decent stability over measurements. Conversely, SW showed relatively low stability over measurements in both delta (r: 0.15–0.37) and high gamma (r: 0.24–0.25) networks. Figure 1 shows the averaged connectomes.

Conclusion

Brain network characteristics in delta and gamma frequency bands exhibit distinct developmental patterns during the postnatal period in extremely preterm infants. Delta networks show clear signs of maturation as network strength decreases while network optimality increases. The considerable stability of these network characteristics across measurements highlights their potential for outcome prediction, particularly predicting neurodevelopmental disorders such as autism and ADHD, which are believed to stem from disruptions in brain networks.



Connectomes are depicted for infants measured before week 30, between week 30 and week 37, and at term age. The far right column depicts the developmental change for individual connections.

Connectomes are depicted for infants measured before week 30, between week 30 and week 37, and at term age. The far right column depicts the developmental change for individual connections.

None declared

ID 301. Cortical Thickness and Full–IQ Motor Predictors in Children Born Extremely Preterm with and without Discrete White Matter Abnormalities

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Background: There is a high incidence of neonatal white matter abnormalities (WMA) in neonates who are born extremely preterm (EPT). These children are more likely to have subtle neurological impairments such as minor neurological dysfunction. Therefore, we aimed to describe the cortical thickness (CTh) and full–IQ performance in middle school age after EPT birth taking into account discrete WMA. In addition, we assessed possible early motor predictors at 2½ years of CTh and full–IQ in children born EPT with and without discrete WMA diagnosed at 10 years.

Methods: T1–weighted MRI images from fifty children born before 27 weeks gestation and 40 controls (Mage=10.10 years; SDage=0.77) were scored for discrete WMA (see Nosko et al. 2022) and analyzed with Freesurfer (v7.2.0). The assessments included motor measures (i.e., fine and gross motor problems) of Bayley Scales of Infant and Toddler Development — Third Edition (BSID–III) at a mean age of 2½ years. Full–IQ was also assessed with Wechsler Intelligence Scale for Children — Fifth Edition (WISC–V) at 12 years.

Results: No differences were displayed in fine and gross motor problems, and full–IQ score between children born EPT with and without discrete WMA. However, children born EPT with discrete WMA exhibited decreases and increases in regional CTh compared to those children born EPT without discrete WMA; while no differences were found in bilateral mean CTh. Moreover, full–IQ was predicted by fine motor problems in children born EPT without discrete WMA, explaining 37.1% of the variance. Fine and gross motor problems at 2½ years did not predict childhood CTh in neither group.

Conclusions: Fine motor problems at 2½ years was related to cognitive development throughout childhood.

None declared

ID 951. Video analysis of infant spontaneous movements to predict later neurodevelopmental impairments

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Background

Early identification of neurodevelopmental impairments in high risk infant populations is crucial for implementation of early interventions to improve outcome. The Prechtl General Movement Assessment is a proven method for predicting neurological impairments by assessing spontaneous movements in children during the preterm, term and infancy period (Prechtl 1977). These assessments are performed by certified human assessors specifically trained. There are recent attempts (Gross 2022) at detecting signs of neurodevelopmental impairments automatically from videos by artificial intelligence methodology, that we here further developed and fit in data from preterm born infants. This methodology has the potential to act as decision support to the medical staff performing the assessment.

Methods

In this project, we initiated the work by building on the method developed in Groos et al. (2022), however, improved it by employing a richer 3D infant model, the SMIL put forward by Hesse et al. (2018), extending it and fit it to a video dataset of 97 infants

born extremely preterm. Included video data were collected at Karolinska Institutet in Stockholm, Sweden as a part of an on–going randomized clinical trial, the Stockholm Preterm Interaction–Based Intervention (SPIBI) (Baraldi 2020). In a second step, we will explore a number of different deep neural network methods for classification and regression from the pose sequences, e.g., ST–GCN described by Tan et al. (2018), in order to act as a predictor for neurodevelopmental disorders.

Results

The extraction of pose estimation using the proposed methods worked well for the well–controlled video data with a single infant in a controlled environment, please see example in Figure 1. The classification work is ongoing.

Conclusion

The analysis performed showed that the pose extraction methods work well for the video capture data for spontaneous movements of infants. The predictive ability of the proposed methods will be presented.

References

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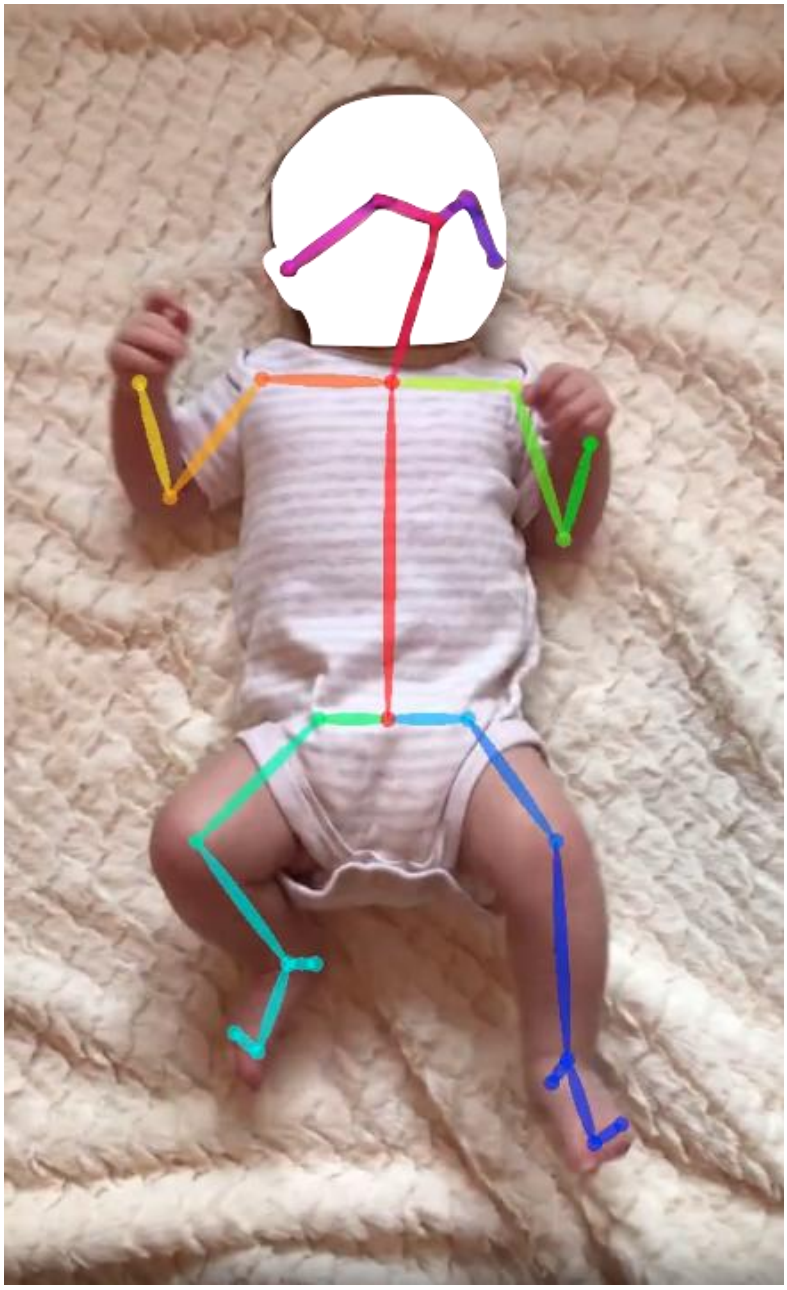

Extracted pose estimation from an example video frame.

Extracted pose estimation from an example video frame.

None declared

ID 492. Vitamin D deficiency in early childhood is associated with problems of cognitive development in late preterm newborns

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Background

Vitamin D deficiency in neonatal period was associated with impaired neurodevelopment during early childhood. However, there is limited evidence from population–based studies on the long–term impact of vitamin D deficiency on cognitive development and linear growth.

The objective of the current analysis is to examine whether vitamin D deficiency during infancy and early childhood is associated with cognitive development in school age in late preterm newborns.

Methods: This is a follow–up study of a placebo–controlled trial among 1000 Crimea late preterm children. We measured growth and neurodevelopment in 791 of these children when they were 6 years old. Neurodevelopment was measured using the Wechsler Intelligence Scale for Children. The vitamin D concentrations during infancy and early childhood was categorized according to the International Medicine's recommendations; serum 25(OH)D < 12 ng/ml as deficient; 12—20 ng/ml as inadequate; > 20 ng/ml as sufficient. In multivariable regression models, adjusting for relevant confounders, we estimated the association between vitamin D status, growth and neurodevelopmental outcomes.

Results: Mean gestation age at birth of the study population was 35±0.8w, with a mean weight of 2479±301. 34.5% were born at 34w, 29.2% at 35w and 36.3% at 36w. 56% were male. Vitamin D status was not associated with any of the cognitive

outcomes or linear growth at follow up. Baseline vitamin D status was available for 716 children who consented. Of these, 328 (45,8%) were deficient, 234 (32,7%) were inadequate, and 154 (21,5%) sufficient. The vitamin D deficiency correlated development delay – 26,4%, speech disorder – 19,4% (r=0,073, p=0,005). The inadequate vitamin D level correlated with development delay — 19% and intellectual impairment – 13,7%(r=0,052, p=0,001).

Conclusion: Our findings supported the notion that poor vitamin D status in early childhood is an important limitation for cognitive development in late preterm children.

None declared

ID 481. The Impact of Premature Birth on Multisensory Processes in Very-preterm Schoolchildren

Mrs Marion Décaillet[1,2,3], Doctor Solange Denervaud[4], Mrs Laureline Besuchet[1], Mrs Cléo Huguenin-Virchaux[1], Doctor Céline Fischer Fumeaux[1], Doctor Micah Murray[1,2,4], **Doctor Juliane Schneider**[1,3]

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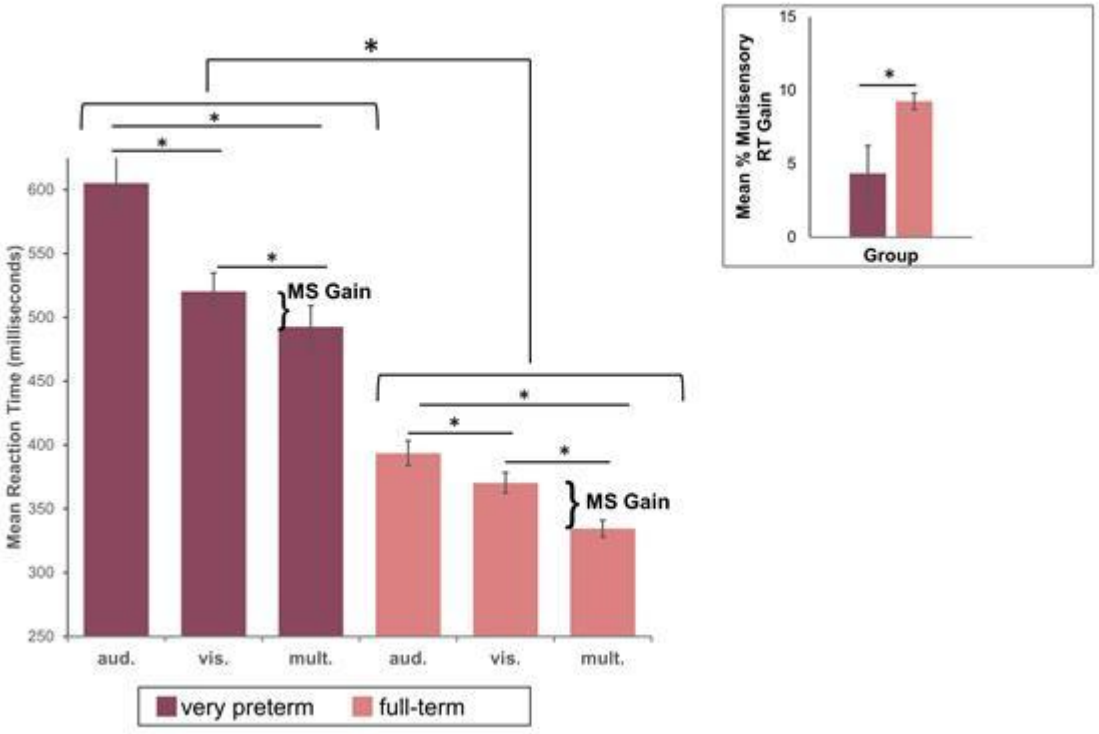
Background: Interactions between stimuli from different sensory modalities and their integration are central to daily life, contributing to improved perception. Being born prematurely and the hospital experience can have an impact not only on sensory processes, but also on the manner in which information from different senses is combined — i.e. multisensory processes. Very preterm (VPT) children (<32 weeks gestational age) present impaired multisensory processes in early childhood persisting at least through the age of five. However, it remains largely unknown whether and how theses consequences persist into later childhood.

Methods: We evaluated the integrity of auditory-visual multisensory processes in schoolchildren who had been born preterm. VPT children (N=28; aged 8-10 years) received a standardized cognitive assessment and performed a simple detection task at their routine follow-up appointment. The simple detection task involved pressing a button as quickly as possible upon presentation of an auditory, visual, or

simultaneous audio–visual stimulus. A matching control group of full–term (FT) children was available.

Results: Compared to FT children (N=23; aged 6–11 years), VPT children were generally slower, regardless of sensory modality, but exhibited similar visual sensory dominance as FT children. While both groups exhibited multisensory facilitation on mean reaction times, there was a significant reduced percentage benefit in VPT children. Moreover, while gains in FT children exceeded predictions based on probability summation and thus forcibly invoke integrative processes, this was not the case for VPT children. Finally, no standardized cognitive or clinical measures were significantly correlated with the multisensory gain in VPT children.

Conclusion: Our findings provide the first evidence of atypical multisensory profiles in VPT children persisting into school age. Therefore, it supports the aim of studying in–depth the underlying neural substrates of multisensory integration in VPT children.



Mean response time differences between stimulus conditions and between VPT and FT children with the representation of their multisensory gain (percentage difference between the multisensory and faster unisensory response time)

Mean response time differences between stimulus conditions and between VPT and FT children with the representation of their multisensory gain (percentage difference between the multisensory and faster unisensory response time)

None Declared

ID 890. EARLY HYPERCONNECTIVITY POST PERINATAL STROKE IS ASSOCIATED WITH COGNITIVE IMPAIRMENTS IN CHILDHOOD

Doctor Nienke Wagenaar[1,2], Doctor Robyn Westmacott[3], Ayako Ochi[4], Ronan Vieira[5], Rouzbeh Zamyadi[2], Doctor Elizabeth W. Pang[2,4], Doctor Benjamin T. Dunkley[2,5,6], Doctor Nomazulu Dlamini[2,4]

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Background

Brain network reorganization after early brain injury is possible due to the inherent neuroplasticity of the developing brain. Still, children who suffered a perinatal arterial ischemic stroke (PAIS) are at risk for cognitive and language impairments in later life. There is little evidence on at how the brain's functional networks respond immediately after PAIS, although we hypothesize that it sets the foundation for how brain networks reorganize and plasticity unfolds.

Methods

This is a case–control study in the Hospital for Sick Children in Toronto, Canada, including patients with a PAIS and neuropsychological assessment performed between 4–6 years of age (n=80). From these, we identified those who had an

good–quality EEG conducted in the newborn period (mean age 4.9 days [SD 4.3]) (n=28). EEG recordings were acquired on either a Stellate Harmonie or Natus Neuroworks 8 system according to the American Clinical Neurophysiology Society Guidelines. A source reconstruction algorithm for neonatal EEG montages was applied and functional connectivity, based on neural synchronisation, was computed using the phase lag index for all pair–wise source combinations to create connectivity matrices. Neuropsychological assessment scores below –1 SD were defined as abnormal. Sources were transformed into MNI space and regions with significant connectivity differences between groups (abnormal versus normal, $p<0.05$, corrected) identified.

Results

There were significant connectivity differences between outcome groups with the abnormal verbal IQ (VIQ) group showing hyperconnectivity in bifrontal and right–hemisphere temporal–parietal regions. The Processing Speed Index (PSI) showed significant increased connectivity in the abnormal group in a distributed pattern. There were no significant group differences for full–scale IQ (FSIQ) and performance IQ (PIQ).

Conclusions

Our findings show that children who develop problems in processing speed at school–age revealed neonatal hyperconnectivity in a network consistent with of the default mode network, which underlies the eventual development of foundational cognitive processes. Children with abnormal language at school–age show neonatal hyperconnectivity in nodes similar to a right–hemisphere language network. Hyperconnectivity immediately post–stroke is an expected compensatory response that is adaptive in the short–term but exhausts resources in the long–term and eventually results in poor functional outcomes.None declared

ID 903 Association between growth in the first two years of life and neurodevelopment at two years of age in moderate and late preterm infants

Miss Anne Lafeber[1], Miss Roxanne de Jong[1], Mr. Mark Bosch[1], Dr. Cornelieke Aarnoudse – Moens[2], Prof. Johannes van Goudoever[2], Dr. Femke de Groof[1]
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Background and aim: Moderate and late preterm infants (MLPTI), infants born with a gestational age between 32 0/7 weeks and 36 6/7 weeks, may be at risk for neurodevelopmental problems later in life. Better growth early in life has been associated with better neurodevelopment in very preterm infants and term–born infants. The aim of the study was to determine the neurodevelopment of MLPTI at two years corrected age for prematurity (CA) and to identify if there is an association between growth in the first two years of life and neurodevelopment at two years CA in MLPTI.

Methods: We prospectively collected anthropometric measurements including weight, length, and head circumference at birth, discharge, and at the corrected ages for prematurity (CA) of six weeks, three months, six months, one–year, and two years. At two years CA, children underwent a cognitive, language, and motor assessment using the Bayley Scales Infant and Toddler Development, Third edition, Dutch version (BSID–III–NL). To determine the association between growth in the first two years of life and scores on the BSID–III–NL at two years CA, we used multivariable linear regression analyses. Regression analyses were adjusted for confounders and multiple testing.

Results: 100 MLPTI were included in this study. The mean BSID–III–NL index score on the cognitive composite was 103.1 (SD 10.9), the mean language index score was 101.1 (SD 15.0), and the mean motor index score was 100.8 (SD 9.6). There was a significant difference between boys and girls in mean index score on the cognitive composite (100.7 vs 107.2, p=0.004) and language composite (97.8 vs 107.1, p=0.003). After correction for multiple testing, we found no significant associations between growth in the first two years of life and neurodevelopment at two years CA.

Conclusion: No significant associations were found between growth in the first two years of life and neurodevelopment at two years CA. Neurodevelopment at two years CA was around average, but boys showed a significantly lower score on the cognitive and language composite compared to girls. This study emphasizes the need for more long–term follow–up and research concerning neurodevelopment in MLPTI, especially boys.

None declared

ID 547. LONG-TERM NEURODEVELOPMENTAL OUTCOME AFTER HYDROCORTISONE SUPPLEMENTATION IN INFANTS WITH NEONATAL ENCEPHALOPATHY

Doctor Kata Kovacs[1], Doctor Marianna Dobi[1], Doctor Eniko Szakmar[1], Zsuzsanna Varga[1], Doctor Unoke Meder[1], Professor Miklos Szabo[1], Doctor Agnes Jermendy[1]
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Background: Hemodynamic instability is a frequent complication in infants with neonatal encephalopathy (NE) receiving therapeutic hypothermia. We previously showed in a randomized, controlled trial (CORTISoL study), that low-dose hydrocortisone (HC) supplementation is effective in raising blood pressure in infants with NE, however, data regarding the long-term safety of this therapy is still awaited.

Methods: A secondary analysis was performed with data collected in the CORTISoL trial. Infants with volume-resistant hypotension during hypothermia were enrolled between 2016 and 2020 at the NICU of the Department of Paediatrics Semmelweis University, Budapest, Hungary. Eligible patients were randomly assigned to receive 0.5 mg/kg HC every 6 hours or the same amount of placebo. Treatment was continued until inotropes were weaned and hemodynamic stability was achieved. Cumulative HC dose was calculated for each patient. Adverse outcome was defined as either mental or psychomotor developmental index <70 points using the Bayley-II test at 18-42 month of age or death. Parental educational level was also registered.

Results: A total of 55 infants with NE were recruited, 26 neonates were assigned to the HC group and 29 to the placebo group, however, due to clinical deterioration, some infants received HC therapy in the placebo group as well. Accordingly, we

performed a safety analysis to compare infants who received HC (n=38) or did not receive HC (n=17) any time during the first week of life. Adverse outcome rates, assessed at median 20 months, were 35% in the population who received HC, and 13% in those who did not receive HC (p=0.054). Multiple logistic regression analysis controlling for disease severity and parental educational level showed that for every 1 mg/kg increase in cumulative HC dose, the odds of adverse cognitive outcome increased by 16% (95% CI 1.01–1.37; p=0.04).

Conclusion: In this study, cumulative HC dose was found to be associated with adverse cognitive outcome in infants with NE and hypotension. To describe potential causality between HC therapy and adverse neurodevelopmental outcome, further studies are warranted. Despite clinical effectiveness, it is paramount to administer HC at the lowest effective dose and for the shortest possible duration in this vulnerable patient population.

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ID 68. Agreement Between Hammersmith Neonatal Neurological Examination (HNNE) And Test of Infant Motor Performance (TIMP) in Neurodevelopmental Profile Assessment of Preterm Infants < 32 weeks' Gestation at Term Corrected Age.

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Objectives: To determine the agreement between HNNE and TIMP at TCA for preterm infants born < 32+0 weeks' gestation, and to evaluate their correlation to PDMS–2 at 12–month corrected age.

Background: The critical period of fetal brain development occurs at 34–41 weeks' gestation. Preterm births place infants at risk of neurodevelopmental delay. Early identification of deviants allows appropriate introduction of interventions, minimizing adverse long–term neurodevelopmental outcomes. Currently, tools used to assess neurological and motor function include the Hammersmith Neonatal Neurological Examination (HNNE) and Test of Infant Motor Performance (TIMP–2) at term–corrected age (TCA). Discharged infants are assessed using the Peabody Developmental Motor Scales (PDMS–2) up to 71 months corrected age.

Methods: Infants born between November 2013 to June 2022 who had both HNNE and TIMP performed at TCA of 37+0–41+6 weeks gestation were enrolled. HNNE and

12–month PDMS–2 findings were categorized as optimal vs sub–optimal. TIMP was categorized as typical vs atypical. Cohen's kappa was used to determine agreement between HNNE and TIMP. Logistic regression and Receiver Operating Characteristic (ROC) curves were used to evaluate their predictive values on motor outcome at 12–month.

Results: HNNE and TIMP done on 125 infants at TCA showed slight, insignificant agreement.
HNNE demonstrated slight and fair agreement with 12–month TMQ and FMQ respectively. Given suboptimal HNNE scores, the odds of suboptimal TMQ and FMQ at 12–month were 3.292 [1.177, 9.208] (p=0.023) and 8.200 [2.261, 29.745] (p=0.001) respectively.
TIMP demonstrated fair agreement with all sub–domains of motor function on PDMS–2 at 12–month. Given atypical TIMP, the odds of suboptimal total, gross, and fine motor quotients at 12–month were 7.418 [2.424, 22.703] (p=0.000), 3.772 [1.282, 11.099] (p=0.016), and 10.909 [3.321, 35.839] (p=0.000) respectively.
Assessments at TCA were predictive of suboptimal fine motor quotient at 12–month with AUC of 0.760 for HNNE (p=0.011) and 0.718 for TIMP (p=0.032). There was no statistical difference between the AUC for the 2 assessments tools (p=0.741).

Conclusions: HNNE and TIMP done at TCA do not demonstrate significant agreement. Suboptimal HNNE and atypical TIMP at TCA were predictive of suboptimal fine motor quotient on PDMS–2 at 12–month.

None declared.

ID 1013. Possible role of brain lesions in neurocognitive outcome: very low birth weight infants with intrauterine growth retardation or small for gastational age.

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Introduction: Premature infants have a higher risk of developing brain lesions. It is not yet clear whether being also a small–for–gestational–age infants or with intrauterine growth retardation might increase this risk. There are discordant opinions in the literature, however these are often ultrasound studies. Ultrasound is certainly the most usable but least specific exam in identifying those minor brain lesions that could otherwise be overlooked.

Methods: We studied all VLBW preterms born at Gaslini Children's Hospital between 2012–2020. Data concerning, MR imaging at term correct age and neurocognitive evaluation at corrected age of 3 years were obtained. MR included Susceptibility Weighted Imaging sequences able to identify even those minimal intracranial bleeding escaping US diagnosis. Diagnosis of IUGR was consistent with abdominal circumference <10 th centile and a reduction of centiles higher than 40 centiles on serial US. Measurements of birth weight, gestational age and cut off values to define

SGA (small–for–gestational–age) babies were evaluated according to Bertino tables. Neurological outcome were evaluated with Griffiths scale (GSMD)

Result: 589 VLBW preterms were included, 45/589 (7,6%) were SGA <3rd centile, 159/589 (27%) were IUGR–infants. SGA <3rd centile infants and IUGR infants showed a higher mean gestational age (GA) than their counterparts (SGA <3rd centile 28.6 weeks vs NON–SGA 30.3 weeks, p0.001; IUGR 28.1weeks vs NON–IUGR 30.3 weeks p0.001). Comparing the different groups by brain lesions, the only difference that emerged was a lower incidence of punctate white matter lesions (PWML) in IUGR infants compared to non–IUGR infants (Table1). Comparing outcomeneurocognitive at 3 years no difference emerged between SGA<3rd centile and NON–SGA while the mean General Quotient of IUGR vs NON–IUGR is respectively 81.55 ± 12.40 vs 86 ± 15.39, p0.04

Conclusions: In conclusion, we can state that IUGR–VLBW, while showing a lower incidence of minor white matter lesions (PWML) already have moderately worse neurocognitive functions at the age of 3 years than infants of the same gestational age who did not show growth retardation. This finding would invite functional studies with sophisticated MRI techniques such as DTI and restricted functional connectivity.

None declared"