Morphological brain changes and CC size were evaluated using standard MRI sequences. The MRI evaluators were not informed about the results of visual examinations.

Results Impaired visual acuity was detected in 9/12 cases with abnormal CC (75%) and in 10% of children with normal CC ($p < 0.01$). There was a significant correlation between the CC size and Frostig test results (abnormal CC group vs. normal CC group: 91 vs. 80.7 points; $p = 0.03$ adjusted for history of ROP). Absence of stereoscopic vision was more frequent in the group of abnormal CC (7/12 vs. 2/20; $p = 0.03$). The frequency of abnormal VEP was similar in the both groups.

Conclusion A strong correlation between vision impairment and CC size was observed. This suggests that CC plays important function in integration of visual perception.

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PO-0416 2ND TRIMESTER HEAD SIZE IN FETUSES WITH CONGENITAL HEART DISEASE: A COHORT STUDY

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Background and aims Congenital heart disease (CHD) is associated with neuro-developmental disorder. The influence of CHD on the brain is believed to begin during pregnancy. The aim of this study is to describe a 2-year cohort of fetuses with major and minor CHD and to investigate if and when during pregnancy cerebral growth is disrupted. We hypothesise that fetal cerebral growth is impaired as early as 2nd trimester.

Method Pregnant women in Denmark (more than 95%) attend two publicly funded ultrasound scans; at 12 weeks gestational age (GA) and at 19–20 weeks GA. Fetal biometrics and abnormal ultrasound findings are registered. Fetuses in Western Denmark (2.9 mill inhabitants) screened between January 1st 2012 and December 31st 2013, diagnosed with any structural, non-syndromic CHD either during pregnancy or up to six months after birth, are included in the study.

Results 129 fetuses with CHD were identified prenatally. Ninety-eight (76%) were genetically screened, primarily by chromosomal micro-array analysis ($n = 72$). Nineteen pregnant women (15%) declined invasive testing. Twenty-three fetuses (18%) were excluded due to genetic syndromes, mainly aneuploidies ($n = 14$) and seven (5%) were excluded due to extra-cardiac malformations. Ninety-nine fetuses (77%) with presumed non-syndromic CHD were included. Head circumference in week 19–20 was significantly smaller than average with a mean z score of -0.4 (95% CI: -0.7 , -0.2) ($p < 0.01$). Analyses are undergoing and results will be presented at the meeting.

Conclusions Preliminary unadjusted results suggest that fetal cerebral growth in children with CHD may be disrupted as early as 2nd trimester.

PO-0417 WITHDRAWN

PO-0418 BRAIN PROCESSING OF MUSIC IN THE NEWBORNS

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In newborns, some basic music processing seems to be present few days after birth (1). Neonatal intensive care units are willing to use music to enrich preterm infant environment. Indeed, researches in neonatal intensive care units showed music impacts on physiological and behavioural responses, caloric intake, and energy expenditure of premature babies (2). The aim of this study is to understand how music is processed in newborns and if premature birth impacts on this processing.

Twenty-four healthy newborns (14 preterm scanned at term equivalent age and 10 full-term infants) have been recruited. Infants underwent functional MRI (fMRI) at 3T during natural sleep or while resting quietly in the scanner without any sedation. FMRI data were realigned; coregistered; normalised to a T2 neonatal template; and smoothed. Random-effect analyses have been done to observe the group activation on all newborns and to compare term and preterm newborns.

At the group level, we observed bilateral activation of auditory regions. At the cluster level, the right auditory cortex ($p = 0.028$, corrected for multiple comparison, extent = 70 voxels) was more activated than the left auditory cortex ($p = 0.067$, corrected for multiple comparison, extent = 52 voxels) during music. Furthermore, no difference was found between full-term and premature groups.

Our preliminary results show functional asymmetry in auditory cortex already present at 40weeks gestational age. Those results corroborate with those found in adults (3), in processing pitch changes in 3-to-6 month's old children (4) and in full-term newborns (1). More analyses are needed to explore further music processing differences in these two populations.

PO-0419 INCIDENCE OF CEREBRAL OXYGEN DESATURATION AMONG NEONATES UNDERGOING GENERAL ANAESTHESIA

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Background Cerebral autoregulation (CA) is a physiologic mechanism ensuring constant blood flow to the brain independent of changes (within physiological limits) in mean systemic blood pressures. Compromised CA can lead to ischemia, associated with hypoxic injury and long term sequelae. The efficiency of CA in neonates is not well-known, especially during general anaesthesia. We aimed to determine incidences of significant cerebral desaturation (S_{cO_2}).

Methods Observational data were collected from 33 premature and term neonates (up to post-menstrual age 44 weeks), receiving general anaesthesia for surgery. Near-infrared spectroscopy (ForeSight® CerebralOximeter, CASMED, USA) was used to non-invasively measure regional S_{cO_2} . When used, invasive arterial pressures were recorded electronically. We then calculated the

cerebral oximeter index (COx), to estimate adequacy of autoregulation. The lowest mean arterial pressure at which the COx was ^{1,2}

Results Incidence of cerebral desaturations across the patient population was 30.3%(n = 10). Very premature neonates with severe haemodynamic instabilities undergoing surgery presented greater depressions in S_cO₂. Additionally they showed evidence of impaired autoregulation compared to hemodynamically stable neonates. Incidence of loss of CA according to COx was 33% (n = 11) in this patient group.

Discussion Results obtained demonstrate that sick neonates are more prone to decreased S_cO₂. Further research, with a bigger patient population is needed to determine the incidence more accurately, and its significance and consequences for outcome of these findings.

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PO-0420 WITHDRAWN

PO-0421 CRANIAL ULTRASOUND FINDINGS IN ASYMPTOMATIC FULL TERM INFANTS

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Background There has been no study assessing cranial ultrasound (cUS) scans in well newborn infants in Armenia. Our study objective was to assess the cUS scans of asymptomatic term newborns in postnatal ward and identify CUS abnormalities by using high quality ultrasound.

Methods Cohort of otherwise healthy term newborns born between 20 March 2013 and 26 April 2013 in RCMCHP, Yerevan, Armenia, were scanned by single investigator (PM) accordingly a standart protocol using zone ultra Convertible Ultrasound System machine with a 7.5 frequency microconvex C9–4t tightly curved array transducer.

Results Data from 121 infants scanned at a median age of 2.5 postnatal days were analysed. Mean birth weight was 3357 g (± 401), gestational age - 39.6 weeks (± 0.7), Apgar score at 1st and 5th minutes - 9, number of males - 67 (55%) and twins - 4 (3.3%). Majority of infants were born by spontaneous cephalic mode - 85%, emergency and planned C - sections were performed respectively in 7% and 8% of cases.

Only 79% of scans were considered normal. Most frequent finding was lenticulostriate vasculopathy found in nine infants

(7.4%). Isolated focal peritrigonal white matter echogenicity was seen in eight (6.6%), subependymal pseudocysts in two (1.6%), choroid plexus cysts in three (2.5%) and lateral ventricle asymmetry in four (3.3%) infants.

Conclusions We did not find any correlation between perinatal data and cUS findings. Asymptomatic term Armenian newborns in 21% of cases had abnormalities on cUS. This study can provide data for comparison with findings in sick and premature infants from similar population.

PO-0422 EVALUATION OF CEREBRAL PERFUSION IN SMALL FOR GESTATIONAL AGE NEONATES IN THE FIRST POSTNATAL WEEK USING COLOUR DOPPLER SONOGRAPHY

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Background and aims Small for gestational age neonates (SGA) living in conditions of chronic hypoxia during fetal life may develop different autoregulation mechanisms in cerebral perfusion in order to maintain oxygen delivery to the brain in comparison to appropriate for gestational age (AGA) neonates.

The aim of the current study was to estimate brain perfusion in SGA neonates during first postnatal week with the use of colour Doppler sonography.

Patients/methods Transcranial Doppler sonography from the temporal acoustic window was performed bilaterally with CX50 PHILIPS device using S8–3 transducer in the first, third and seventh day of life of SGA neonates with mean gestational age 31.6 ± 2.2w and to comparable AGA ones. Recorded parameters were Peak Systolic Velocity (PSV), End Diastolic Velocity (EDV), Mean Velocity (MV), Pulsatility Index (PI) and Resistance Index (RI) in middle cerebral artery MCA.

Results 26 SGA and 26 matched for GA control AGA neonates were prospectively enrolled with statistically significant difference in birth weight (1.201, 9 ± 369.1 vs 1.805, 3 ± 431.7, p < 0.0001), in head circumference (27.4 ± 2.8 vs 30.0 ± 2.4, p = 0.01) and haemoglobin in first postnatal day (17.7 ± 1.7 vs 15.9 ± 1.6, p < 0.0001). Fetal Doppler were pathological in 6 SGA neonates. Doppler study showed a gradual increase in PSV and MV during the first week bilaterally in both groups with statistically significant difference between them in MV in the third day (Right p = 0.017, Left p = 0.05). EDV in right MCA was also found higher in SGA neonates in the second measurement (p = 0.04). No statistically significant differences were found in the resume parameters.

Conclusion Increased brain metabolism in the first postnatal days is responsible for the observed augmentation of cerebral perfusion in order to maintain the balance between oxygen

Abstract PO-0423 Table 1 Comparison of brain oxygenation and perfusion between SGA neonates with different gestational age

	1st measurement		2nd measurement		3rd measurement	
	28–32w	32–36w	28–32w	32–36w	28–32w	32–36w
TOI right	68.34 ± 9.48	74.06 ± 7.45	72.75 ± 6.49	72.33 ± 6.60	69.97 ± 9.31	70.24 ± 8.70
TOI left	67.80 ± 8.49	73.24 ± 8.56	69.62 ± 11.37	71.32 ± 6.30	70.86 ± 7.50	71.19 ± 7.51
FTOE right	0.31 ± 0.10	0.24 ± 0.09	0.22 ± 0.07	0.27 ± 0.06	0.30 ± 0.10	0.28 ± 0.09
FTOE left	0.30 ± 0.10	0.26 ± 0.10	0.25 ± 0.12	0.27 ± 0.06	0.30 ± 0.07	0.28 ± 0.08
THI right	1.81 ± 0.81	1.18 ± 0.98	1.23 ± 0.47	1.33 ± 0.8	1.71 ± 1.13	1.22 ± 0.50
THI left	1.10 ± 0.55	1.38 ± 0.78	1.56 ± 1.05	1.36 ± 1.06	1.25 ± 0.73	1.62 ± 1.00