

Javeriana, Bogota, Colombia; ⁵Hospital Clinico de la Universidad de Chile Jose Joaquin Aguirre, Santiago, Chile; ⁶Women-Mother-Child, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland; ⁷Maternal Fetal Medicine, BCNatal – Barcelona, Center for Maternal Fetal and Neonatal Medicine (Hospital Clinic and Hospital Sant Joan de Déu), Barcelona, Spain; ⁸Fetal i+D Fetal Medicine Research Center, IDIBAPS, BCNatal – Barcelona Center for Maternal Fetal and Neonatal Medicine (Hospital Clinic and Hospital Sant Joan de Déu), University of Barcelona, Barcelona, Spain; ⁹Pompeu Fabra University, Barcelona, Spain

Objectives: The association between SGA and ADHD has been described, but the mechanisms and specific neuroanatomical modifications remain poorly documented. Here, we explore adult brain imaging and functional evaluation in patients born SGA.

Methods: A cohort study in adults born between 1975–1995 (mean age 33.9 y; N=98, 53 SGA defined as birthweight<10th centile and 45 controls). MRI T1 scans and Adult ADHD Self-Report Scale (ASRS) questionnaires were collected. Freesurfer software was used for cortical and subcortical data processing. Cluster- and voxel-wise analysis were used to assess cortical and subcortical brain morphometry. ADHD using the ASRS was based on a dichotomous method. Association between ASRS and neuroanatomical regions was explored using a Welsh t-test.

Results: SGA had a 6% reduction in estimated intracerebral volume. Cortical morphometric changes included symmetrical decreases in surface area in prefrontal and posterior cingulate regions, as well as reduction volume in insulates, prefrontals, postcentrals, lateraloccipitals, and left unilateral fusiform regions. Subcortical structures also showed significant voxel-wise differences: WM cerebellum, thalamus, basal ganglia, posterior corpus callosum. ADHD rates showed no significant differences between SGA and controls (8% vs 7.32%, p-value=0.9). However, elevated ASRS scores in SGA were linked to a smaller left superior frontal area (Adjusted mean difference [AMD], Δ , 0.113 mm², 95%CI 0.03–0.2) and reduced bilateral latero-occipital volume (AMD Right Lateraloccipital, Δ , 0.48 mm², 95%CI 0.26–0.71; AMD Left Lateraloccipital, Δ , 0.28 mm², 95%CI 0.16–0.4).

Conclusions: This study shows long-lasting cortical morphometric changes in adults born SGA. Global volume reduction and regional alterations in surface area and volume might partially explain the reported association between SGA and ADHD.

OC14.05

Effectiveness of pentoxifylline in severe early-onset fetal growth restriction: a randomised double-blinded clinical trial

H. Vafaei¹, N. Asadi¹, S. Roozmeh¹, N. Asmari², A. Jamshidzadeh³, K. Bazrafshan¹, M. Kasraeian¹, A. Faraji¹, Z. Shirvani¹, A. Mokhtar Pour¹, S. Moradi Alamdarloo¹

¹Obstetrics and Gynecology, Maternal-Fetal Medicine Research Center, Shiraz University of Medical Sciences, Shiraz, Islamic Republic of Iran; ²Shiraz University of Medical Science, University Hospital, Shiraz, Islamic Republic of Iran; ³Pharmaceutical Sciences Research Center, Shiraz University of Medical Sciences, Shiraz, Islamic Republic of Iran

Objectives: Management of pregnancy complicated by severe early-onset fetal growth restriction (FGR) is one of the most challenging obstetrical issues. So far, there has not been a proven option for the treatment or improvement of this condition. Improper immune response during placentation leads to inadequate trophoblast invasion and impaired utero-placental perfusion. Pentoxifylline improves the endothelial function and induces vasodilation by reducing the inflammatory-mediated cytokines. We have evaluated the effect of Pentoxifylline on fetal-placental perfusion, neonatal outcome, and the level of oxidative stress

markers before and after the intervention in the setting of severe early-onset FGR.

Methods: This study is a pilot randomised clinical trial on 40 pregnant women who had developed early-onset growth restricted fetus. Pentoxifylline and placebo were given with a dose of 400mg per os two times daily until delivery. Serial ultrasound examination regarding fetal weight, amniotic fluid and also utero-placenta-fetal Doppler's were done. For the assessment of serum Antioxidant level, blood sampling was done once at the beginning of the study and again, at least, three weeks after the investigation. After delivery, umbilical-cord blood gas analysis, APGAR score at1 and5min, NICU admission, and neonatal death were recorded and compared between the two groups.

Results: Fetal weight gain was significantly higher in the Pentoxifylline group before (996.3 ± 317.41) and after (1616.89 ± 527.90) treatment ($P = 0.002$). Total serum antioxidant capacity significantly increased in the Pentoxifylline group ($p < 0.036$). Average 5 min Apgar score was significantly higher ($P < 0.036$) and the percentage of babies admitted to NICU was significantly lower ($P < 0.030$) in the treated group.

Conclusions: Using Pentoxifylline in pregnancy affected by FGR might show promising effects. In this study, Pentoxifylline improved the neonatal outcome, increased fetal weight gain, and reduced neonatal mortality by decreasing the level of oxidative stress markers and cutting down the inflammatory cascade.

OC14.06

Optimal management and timing of delivery in late fetal growth restriction at term using a risk stratification protocol

P.P. Athauda^{1,2}, R. MacSwan^{1,2}, J. Stokes², C. Ammari^{1,2}, R. Dudley³, D. Casagrandi^{1,2}, Z. Li⁴, A. Zaikin^{1,4}, R. Napolitano^{1,2}

¹University College London Elizabeth Garrett Anderson Institute for Women's Health, London, United Kingdom; ²University College Hospital Women's Health Service, London, United Kingdom; ³University College London Medical School, London, United Kingdom; ⁴University College London Department of Mathematics, London, United Kingdom

Objectives: The aim of the study was to prospectively evaluate in over 1000 patients, a protocol for late fetal growth restriction (FGR) management classifying pregnancies at high or low risk of adverse perinatal outcome using ultrasound parameters.

Methods: This was a prospective study of women with a non-anomalous singleton pregnancy from 32 weeks, at University College London Hospital, UK, between 2018 and 2022. Women were included if any of the following was present: estimated fetal weight (EFW) ≤ 10 th centile (c.), abdominal circumference (AC) decrease ≥ 50 c. compared with a previous scan, umbilical artery (UmbA) Doppler pulsatility index (PI) > 95 th c. or cerebroplacental ratio (CPR) < 5 th c. High-risk cases were delivered at 37–38 weeks if there EFW < 10 th c. plus any of the following: EFW < 3 rd c. or AC > 50 c. drop, or UmbA PI > 95 th c. or CPR < 5 th c. Otherwise late FGR was considered as Low-risk and managed conservatively until 40–41 weeks. The primary outcome was a composite of severe adverse perinatal outcomes including any of the following: stillbirth, neonatal or infant death, advanced resuscitation, 5 min APGAR < 7 , UmbA pH < 7 , sepsis, cerebral, respiratory and circulatory morbidity. Multiple logistic regression analysis was performed. Sample size was powered to explore differences in severe adverse neonatal outcome.

Results: 408 and 594 of 1002 patients were classified as High- and Low-risk FGR respectively. Neonates from the High-risk group were twice as likely to have severe adverse perinatal outcomes [8.3 Vs 3.2%, aOR 2.1 (95% CI 1.2–3.9), $P = 0.02$]. There was no extended perinatal mortality in the Low-risk group.

Conclusions: Our study demonstrated that appropriate risk stratification of late FGR allows pregnancies at low risk of adverse perinatal outcomes to be managed conservatively at term up to 40–41 weeks with improved perinatal outcomes compared with the High-risk group, and no increase in perinatal mortality.

OC14.07

Cortical development in fetal growth restriction: a neuro-imaging study

I. Valenzuela¹, G. Martí⁵, Y. Gomez¹, M. González Ballester⁴, G. Piella³, E. Eixarch^{1,2}

¹Fetal Medicine Research Center, BCNatal – Barcelona Center for Maternal Fetal and Neonatal Medicine (Hospital Clinic and Hospital Sant Joan de Déu), University of Barcelona, Barcelona, Spain; ²Institut d'Investigacions Biomèdiques August Pi I Sunyer and Centre for Biomedical Research on Rare Diseases, Barcelona, Spain; ³Departament de Tecnologies de la Informació i les Comunicacions, Pompeu Fabra University, Barcelona, Spain; ⁴Department of Information and Communication Technologies, BCN Medtech, ICREA and Pompeu Fabra University, Barcelona, Spain; ⁵BCN MedTech, Department of Information and Communication Technologies, Pompeu Fabra University, Barcelona, Spain

Objectives: To study the global changes in FGR by automatic segmentation and cortical reconstruction in fetal brain MRI and explore which cortical areas are most affected.

Methods: Low-resolution 2D MRI T2-Haste scans were acquired and 3D MRI images were generated with a super-resolution reconstruction algorithm. An automated method segmented the brain into white matter (WM), grey matter (GM), and cerebrospinal fluid (CSF) tissues, and further into 87 regions. After reconstruction, a cortex mesh for each subject was obtained. Cortical thickness, sulcal depth, and curvature were extracted and defined vertex-wise over each mesh. Volumetric and cortical region-based markers were compared correcting for gestational age (GA) and sex. Random field theory correction (RFTC) was applied.

Results: We included 50 controls (37.4 ± 0.9 GA) and 50 FGR (37.3 ± 1.2 GA). FGR brains had decreased cortical thickness, ($t = -3.6$; $p < 0.001$), total brain volume ($t = -3.81$; $p < 0.001$), GM volume ($t = -4.23$; $p < 0.001$), WM volume ($t = -2.75$; $p < 0.001$), and cortical surface area ($t = -2.63$; $p < 0.01$). The left temporal and parietal lobe, and specific areas of the right temporal and frontal lobe, showed increased cortical thickness for controls after RFTC.

Conclusions: Cortical changes in FGR can be detected using global and local markers extracted from automated algorithms. Further studies are needed to perform a multivariate cortical surface analysis to detect subtler changes.

Supporting information can be found in the online version of this abstract

OC14.08

Risk factors and association of short interval from diagnosis to delivery in preterm fetal growth restriction

A. Dall'Asta¹, T. Stampalija², H. Wolf³, C. Lees⁴

¹Department of Medicine and Surgery, Obstetrics and Gynecology Unit, University of Parma, Parma, Italy; ²Unit of Fetal Medicine and Prenatal Diagnosis, Institute for Maternal and Child Health, IRCCS Burlo Garofolo, Trieste, Italy; ³Obstetrics, Amsterdam University Medical Center, AMC Campus, Amsterdam, Netherlands; ⁴Imperial College Healthcare NHS Trust, London, United Kingdom

Objectives: To identify risk factors for short (i.e. <7 days) time-to-delivery interval in fetuses suspect of preterm fetal growth restriction (FGR) secondary to uteroplacental insufficiency, in order to facilitate timing of corticosteroids for fetal maturation and counselling.

Methods: Secondary analysis of data combined from two multicentre studies conducted across European perinatal centres: The Trial of Umbilical and Fetal Flow in Europe randomised controlled trial (TRUFFLE RCT) and the prospective TRUFFLE2 feasibility study. The TRUFFLE RCT included women with FGR at 26–32 weeks and randomised abnormal ductus venosus PI and computerised cardiotocography (cCTG) versus only cCTG to decide when to deliver the baby. The TRUFFLE2 included women at 32–36 weeks with suspected FGR and collected monitoring parameters longitudinally. The endpoint of interest for the study was interval from inclusion to delivery <7 days. The parameters that were associated with such endpoint were assessed first by univariate analysis, then by multivariate logistic regression analysis.

Results: The study cohort consisted of 1359 women, of whom 503 from the TRUFFLE RCT and 856 from the TRUFFLE 2 feasibility study. Gestational age at delivery, UCR, the severity of growth restriction and pre-eclampsia all were associated with short inclusion-to-delivery interval. The area under the curve (AUC) of a receiver characteristics graph (ROC) was 0.83 (95% interval 0.80–0.85).

Conclusions: The proposed model for the prediction of interval from diagnosis to delivery <7 days has fairly good accuracy and could potentially be used for timing steroids administration and counselling at the time FGR is diagnosed.

OC15: EARLY PREGNANCY COMPLICATIONS

OC15.01

Radiomics analysis of early pregnancy ultrasound images to predict viability at the end of first trimester

S. Murugesu^{1,2}, K. Linton-Reid², J. Barcroft^{1,2}, M. Pikovsky^{1,2}, C. Cooper¹, B. Ijaiya¹, A.M. Novak^{1,2}, N. Cooper^{1,2}, S. Saso^{1,2}, E. Aboagye², T. Bourne^{1,2}

¹Gynecology, Imperial College Healthcare NHS Trust, London, United Kingdom; ²Imperial College London, London, United Kingdom

Objectives: Identify radiomic ultrasound features from the pregnancy of unknown viability diagnosis images, which may predict subsequent loss. Radiomics offers a quantitative method to assess heterogeneity between images, which can be more stable compared to subjective assessment.

Methods: A retrospective, multi-site study, included 500 cases of early pregnancy 'pregnancy of unknown viability' (PUV). Longitudinal cross-sectional ultrasound images were extracted and segmented from Queen Charlotte's and Chelsea Hospital (QCCCH), London ($n = 400$, split 8:2 for training and validation) and St. Mary's Hospital (SMH), London (test data set $n = 100$). Clinical data including age, ethnicity, gestational age, symptoms and operator-recorded ultrasound features were collected. A radiomics prediction model was developed by comparing several ML models using convolutional neural network-based models and traditional radiomics features. The area under the ROC curve (AUC), F1-score, and recall to assess model performance.

Results: The QCCCH and SMH data sets were in the majority well matched and consisted of 53.3% and 53% miscarriage cases by end of first trimester, respectively. The best performing radiomics classification model (Support Vector Machine model in combination with Mutual Info feature selection technique) for