Methods: Cases with umbilical venous thrombosis diagnosis during Jan, 2018 to Feb, 2018 were reviewed for history, fetal heart monitor pattern during labour, ultrasound report, and laboratory reports.

Results: A total of three cases with umbilical venous thrombosis were recruited for the study. The indications of admission were preterm labour, unsatisfactory fetal monitor with gestational diabetes mellitus, and onset of labour at term respectively. All cases delivered by emergent Caesarean section for persistent abnormal fetal heart monitor pattern, and all the babies were good except the preterm one at 32 weeks of gestation who was transferred to NICU immediately for respiratory acidosis and pneumonia. Their birthweights were compatible with gestational ages. The pathology examination of placentas all revealed as chorioamnionitis. All the ultrasound examination during pregnancy and at the time of admission of these three cases were reported normal. Except for the preterm mother whose WBC rose to 25.6+/-0.7/L, the CBC of other two pregnant women at time of delivery were all normal.

Conclusions: Cases with persistent abnormal fetal heart monitoring may be a reliable sign for umbilical venous thrombosis and should be handle with great care. Umbilical venous thrombosis is related to clinical and subclinical chorioamnionitis.

EP04.06
Systolic and diastolic time interval ratios of the ductus venous flow velocity waveform in fetal growth restriction

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Objectives: To investigate the sequential changes of time intervals of the ductus venous (DV) flow velocity waveform (FVW) in fetuses with growth restriction (FGR).

Methods: This is a retrospective longitudinal observational study on 26 FGR cases, and the study population was divided into two groups: Group 1 with abnormal umbilical artery (UA) Doppler, which is defined as elevated UA pulsatility index (PI) more than 95 percentile of the normal reference range, and Group 2 with normal UA Doppler. Time intervals of systolic (S) and diastolic (D) components of DV-FVW were measured and the ratios (S/D ratios) were calculated and converted to Z-scores for statistical analysis. The last measurements performed within 7 days of delivery and measurements one week before the last examination were used for analysis.

Results: Thirteen cases in Group 1 and 11 cases in Group 2 were included in this study. The median gestational age of delivery and birth weights were 28+2 (range, 27+1-32+3) and 626g (range, 350-1026) in Group 1 and 38+1 (range, 36+2-40+3) and 1972g (range, 1503-2360) in Group 2. Compared to reference range of S/D ratio which has been established by our group previously, S/D ratios in Group 1 showed significant decrease (p<0.005), while in Group 2, S/D ratios did not show significant change. Also, in Group 1, decrease of S/D ratios were more pronounced in the last prenatal week.

Conclusions: S/D of DV-FVW decreased in FGR with abnormal UA Doppler in the last week of pregnancy. Our findings suggest that S/D of DV-FVW might predict deterioration of fetal status.

EP04.07
Association of cerebroplacental ratio and placental vascular malperfusion in normally grown fetuses

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Objectives: To investigate the use of fetal cerebroplacental ratio (CPR) to identify placental vascular malperfusion.

Methods: Sixty-five full-term pregnant women were studied prospectively in the third trimester of pregnancy. Doppler ultrasound examination of umbilical artery (UA), middle cerebral artery (MCA), and uterine artery (UtA) was performed at 35-40 gestational weeks. The pulsatility index (PI) was calculated. The CPR was calculated as the ratio between the MCS PI and the UA PI. All Doppler indices were converted into multiples of median (MoM), correcting for gestational age using reference ranges. CPR < 0.6765 MoM was regarded as abnormal value. All Doppler indices were converted into multiples of median (MoM), correcting for gestational age using reference ranges. Histological characteristics of placentas were classified as normal, histological chorioamnionitis and vascular underperfusion.

Results: The CPR values of fetuses were not significantly associated with abnormal pathologic findings. Fetuses with an abnormal CPR value were significantly more likely to have an adverse composite perinatal outcome and higher rates of Caesarean delivery. Cord gas analysis was not associated with low CPR value.

Conclusions: A low CPR was associated with increased rates of adverse composite perinatal outcome, but not associated with abnormal pathologic findings.

EP04.08
Abstract withdrawn

EP04.09
The value of fetal umbilical Doppler study in prediction of adverse fetal outcome in early-versus late-onset intrauterine growth restriction

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Objectives: To evaluate the value of fetal umbilical artery (UA) Doppler in prediction of adverse fetal outcome in early versus late onset intrauterine growth restriction (IUGR).

Methods: A retrospective cohort study was performed by reviewing data from the medical records. A total of 105 singleton pregnant women who were diagnosed as IUGR and referred to Maternal-Fetal-Medicine Unit, Thammasat University Hospital from Jan 2014 to Dec 2016 were recruited. Early and late IUGR were categorised by diagnosed before 28 weeks and after 28 weeks, respectively. IUGR was defined as a fetus with estimated weight below 10th percentile at their GA. An abnormal UA Doppler was defined as high pulsatility index, absent end diastolic, or reverse end diastolic flow.

Results: Total of 105 pregnant women who were diagnosed as IUGR, 19.05 % and 80.95 % had early and late IUGR, respectively. The clinical outcomes were shown in the figure. In early IUGR group had significantly higher percentage of abnormal UA Doppler and amino acid fluid index (AFI) compared to late IUGR group (40% vs. 8.24% and 55% vs. 27.06%, p<0.001 and p<0.016, respectively). The others clinical outcomes were shown in the table. Neonatal death was significantly higher.
in early IUGR group with abnormal UA Doppler compared to late IUGR (30% vs. 1%, p<0.001).

The multivariable logistic regression model demonstrated the predictive factor of birthweight below 10th percentile at delivery was an abnormal UA Doppler with risk ratio 22.16 (p=0.006).

Conclusions: An abnormal UA Doppler was significantly detected in early IUGR fetus. Also, it was a strong predictor for prediction of adverse fetal outcome especially on low birthweight at delivery in IUGR pregnant women.

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

**EP05: FETAL GROWTH**

**EP05.01** Customised Indian biometry of the length and height of fetal corpus callosum by 2D ultrasound

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Objectives: The aim of this study was to develop customised reference ranges for basic quantitative characteristics of the corpus callosum (CC) between 19 to 32 weeks of gestation for the Indian population from a prospective cross-sectional study.

Methods: Patient selection was done according to the inclusion and exclusion criteria. Total sample size was 166. Each fetus was examined only once. High resolution two-dimensional images of the mid-sagittal plane of fetal brain were obtained by transvaginal ultrasound. The length of CC was measured from the most anterior aspect of the genu to the most posterior aspect of the splenium, tracing a straight rostrocaudal line. Height (thickness) was measured at the mid-body part of CC. Regression equations for mean and SD values were generated from the dataset. Using mean and SD values for each gestational age, fitted centiles were created for the length as well as the height of CC.

Results: The growth rate of the corpus callosal length is almost constant between 19 and 32 weeks, with the mean length doubling from 18mm at 19 weeks to 35.7mm at 28 weeks. The increase in length is almost constant at 2mm per week.

The height of the body of CC increased from 1.9mm at 19 weeks to 2.3mm at 32 weeks. The maximum growth was seen between 19-23 weeks, following which it stayed relatively constant at 2.3mm ± 0.1mm in size.

Conclusions: As a result of technological advances, the high resolution CNS imaging possible by transvaginal ultrasonography provides an excellent method for direct examination of the CC. With this study, we have generated the reference ranges for the measurement of CC in the Indian population. This data can be used for the assessment of normal brain development, as well as for suspected fetal CNS defects. Furthermore, accurate measurement of the height (thickness) can help in the diagnosis of more subtle anomalies associated with “callosal thinning”. As per our knowledge, ours is the first study to publish population specific reference ranges for the measurement of corpus callosum in the Indian population.

**EP05.02** Optimal gestation window to perform third trimester ultrasound screening for fetal growth disorders according to the main assessment index for newborns (PrediFeG): a randomised controlled trial study protocol

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Objectives: We present a research protocol (IRB, V.1 16 October 2017) for PrediFeG trial, which assesses the optimal strategy for the prenatal identification of fetuses at risk of pathological growth. The protocol is based on the combined approach of fetal biometry, Doppler velocimetry in fetomaternal districts, biochemical markers in maternal blood at scan and umbilical cord at delivery, histological evaluation of placenta, and neonatal well-being, assessed by the morbidity assessment index for newborn (MAIN). The primary aim is to identify the optimal window to perform the ultrasound screening during third trimester, and the second one is to ascertain the most effective combined approach for maximising the performance of the diagnostic strategy.

Methods: The study is designed as a single centre, open-label, randomised trial with three (at 31+0-33+6, 34+0-36+6, 37+0-39+6 weeks of gestation) parallel groups in addition to routine one (at 28+0-30+6 weeks of gestation). Participants will be randomly allocated to receive the additional third trimester scan in one of the three subsequent gestational age intervals and blinded to the results. Baseline and clinical data will be recorded from the routine scan and updated at all consecutive steps of the research project. Univariate (with estimated effect size and its 95% CI) and multivariate (mixed effects logistic regression) comparison between groups will be performed. Goodness-of-fit models and their performance will be evaluated by calculating Nagelkerke’sR2 and by constructing receiver operating characteristics (ROC) curves (DeLong procedure).

Results: Ongoing.

Conclusions: To be elaborate.

**EP05.03** Estimation of fetal weight using Hadlock’s formulas: is head circumference an essential parameter?

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Objectives: The primary aim of this study was to test the equivalence of two fetal weight estimation formulas generated by Hadlock: H1, a formula that includes head circumference (HC) parameter, and H2, which excludes it. The secondary aim was to identify the population in which H2 formula was less reliable to use.

Methods: This study included 1220 sonographic fetal weight estimations performed within 7 days of delivery. Included cases were of singleton pregnancies, with 24 weeks gestation minimum. Cases of infants with congenital skeletal malformations were excluded. Estimated fetal weight (EFW) was calculated using H1 and H2 formulas. Their accuracies were compared using percent error, the proportion of EFWs falling within ±15% error interval, and by Bland-Altman (BA) analysis. Multivariate-regression was performed to evaluate risk factors affecting weight estimation by H2 formula.

Results: H2 formula presented with higher systemic mean percent error (4.30%) comparing to H1 (2.98%, p<0.001). Likewise, H2 manifested lower accuracy (87.95% prediction) comparing to H1 (92.21%). BA analysis demonstrated that 95% of cases were within (-142.03) – 231.79g (mean 44.8g). The risk factors found to be significant in the multivariate analysis of H2 formula are index birth number (OR 0.866, p<0.01), difference in days between sonographic