Abstract withdrawn

Human long bone development in intrauterine growth restriction: in vitro analysis of the distal femoral epimetaphysis on prenatal MR imaging

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Objectives: To investigate human long bone development in fetuses with intrauterine growth restriction (IUGR) by analysing distal femoral epimetaphyseal structures and bone morphometrics on prenatal MR imaging.

Methods: This retrospective study included 14 fetuses (mean gestational age, 26 weeks 2 days; range, 21 weeks 3 days to 33 weeks) with IUGR caused by placental insufficiency, without other brain or body abnormalities, as well as a total of 192 age-matched normal fetuses. On 1.5-T echo-planar MR images, diaphyseal and epiphyseal morphometric measurements were assessed, and, using a grading system, the cartilaginous epiphysis and metaphyseal shape, secondary ossification, and the perichondrium were qualitatively analysed. Student’s t-testing was used to compare the morphometric measurements of IUGR fetuses with normal fetuses, and descriptive statistics were used to compare the qualitative bone characteristics.

Results: The morphometric measurements of the IUGR fetuses did not exceed the minimum normative measurements at any gestational age (diaphyseal length: p = 0.0001 - 0.0053; epiphyseal length: p < 0.0001 - 0.0022; epiphyseal width: p < 0.0001 - 0.0032). Overall, the same grading for cartilaginous epiphysial shape as observed in IUGR fetuses was found in 28.6% - 100% of normal fetuses, for the metaphyseal shape in 71.1% - 94.4%, for secondary ossification in 16.7% - 100%, and for the perichondrium in 12.5% - 91.7%.

Conclusions: On prenatal MR imaging, fetuses with placental-based IUGR exhibit long bone shortening, whereas their qualitative bone characteristics appear within normal limits. Consequently, the presence of qualitative bone abnormalities should include the differential diagnosis of various fetal skeletal disorders.

Early and late fetal growth restriction: changes in fetal Doppler flow and correlation with pregnancy outcome in China

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Objectives: The aims are(1) insight into the changes in fetal Doppler flow of early FGR and late FGR respectively by ultrasound evaluation(2) to explore ultrasound predictor associated with pregnancy outcome.

Methods: FGR was divided into early FGR (<32 weeks) and late FGR (≥32 weeks) based on the time of onset. A total of 55 early FGR and 57 late FGR were recruited in our study with the normal controls established respectively. Ultrasound evaluation included fetal growth, umbilical artery (UA), heart rate (HR), fetal cardiac function (myocardial performance index, MPI and stroke volume, SV), ductus venosus (DV) and middle cerebral artery (MCA).

Results: Table 1 was shown Fetal Doppler flow changes for early FGR and late FGR respectively. Perinatal morbidity and mortality rate for early FGR was 23/55 (41.8%) but it was only 4/63 (6.3%) for late FGR (P value<0.05). UA PI (OR=92.757), a wave velocity of DV (OR=0.958) and diastolic blood flow velocity of MCA (OR=1.363) were associated with early FGR pregnancy outcome by logistic regression. However, there was no fetal Doppler parameter but estimated fetal weight (OR=0.996) by ultrasound had relationship with late FGR pregnancy outcome.

Conclusions: Early FGR is associated with a series of alterations in fetal Doppler flow. So once it is diagnosed, UA PI, a wave velocity of DV and diastolic blood flow velocity of MCA should be monitored comprehensively by ultrasound Doppler in order to improve pregnancy outcome based on the higher perinatal morbidity and mortality rate. However, late FGR has slight change on fetal Doppler flow, which tends to be good prognosis. As late FGR, estimated fetal weight by ultrasound is more important for pregnancy outcome than Doppler monitoring.

Placental weight and volume related to birthweight and third trimester maternal blood sample in normal and IUGR pregnancies

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Objectives: Studies have reported placental weight ratio (PWR) and maternal hemoglobin (Hgb) as relevant markers of uteroplacental function. Our aim was to investigate the correlations among maternal hemostasis, placental morphology, birth weight and ultrasonographic findings in normal and IUGR pregnancies.

Methods: 13 patients were recruited into the case group based on their newborn’s weight being below the 10th percentile and 41 patients were enrolled randomly. The placental weight and volume were measured and data were compared with the third trimester maternal blood sample.

Results: PWR results were close to that described in literature, 0.14±0.004 in the control and 0.17±0.01 in the IUGR group p=0.0034. In placental morphometry placental volume showed the strongest correlation (R²=0.769), while a. umbilical S/D (R²=0.538) and Hgb level (R²=0.510) showed medium correlation and placental weight showed light correlation (R²=0.446) with birthweight. There was significant difference between the control and IUGR groups in birthweight 3367.73g(±71.52) and 2110.04g(±155.7) p=0.0001, in a. umbilical S/D 2.217(±0.107) and 3.386(±0.309) p=0.0006, in placental volume 523.0cm3(±33.43) and 311.7cm3(±33.73) p=0.0007 and in placental weight 483.4g(±17.89) and 391g(±28.00) p=0.0364
respectively. We found no significant difference in gestational age, gender ratio, MCV, red blood cell count, hematocrit, thrombocyte count, INR, and partial thromboplastin time.

**Conclusions:** IUGR is a diagnostic challenge because fetal biometry has a 50% detection rate. Our results show that placental volume was more concordant with birthweight than placental weight. The estimation of placental volume via ultrasound could complete fetal biometry and a. umbilicalis flowmetry in diagnostic routine. These measurements could increase the accuracy of prediction of pregnancy outcome. We do encourage clinics and investigators to establish a percentile chart for placental volume.

EP14.26 Ketanserin can reduce vascular resistance in umbilical and placental veins but not in arteries both in IUGR and control pregnancies

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**Objectives:** Our aim was to test the vasoreactivity to serotonin, a humoral factor that is present measurably. To get more detailed information we added ketanserin, a selective 5-HT2 receptor antagonist.

**Methods:** Patients were enrolled in case and control groups based on third trimester EFW. The placenta and umbilical cord was immediately placed and stored in Krebs-Henseleit solution until the experiment (max. 24 hours). After incubation, cumulative serotonin dosage (10^-9-10^-5M) was added to the vessels with or without 10^-8M ketanserin.

**Results:** The 3DPD indices were VI=4.5 in IUGR and 10.1 in controls (p<0.001), the FI=38.5 (p<0.05) and 49.2, and the VFI=2.7 and 4.9 (p<0.01) respectively. Reactivity to serotonin considering the end point of each dose is presented in table 1. The contraction of IUGR umbilical arteries was the most powerful (p=0.03) that strongly correlated with a. umbilicalis S/D (r=0.80, R^2: 0.63). From the AUC values, the maximum effects (Emax) (p<0.05) that strongly correlated with a. umbilicalis S/D (r=0.80, R^2: 0.63). From the AUC values, the maximum effects (Emax) (p<0.05) that strongly correlated with a. umbilicalis S/D (r=0.80, R^2: 0.63).

**Conclusions:** Difference of endpoint and AUC analysis depends on how fast contraction reaches its peak. In arteries ketanserin did not alter the vascular reactivity, other 5-HT receptors may dominate the regulation and in veins 5-HT2 receptor may be present more densely and can participate in reducing vascular resistance.

**Table 1. Serotonin concentration that elicits significant contraction**

<table>
<thead>
<tr>
<th>(p&lt;0.05)</th>
<th>IUGR</th>
<th>Control</th>
</tr>
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<tbody>
<tr>
<td>umbilical artery</td>
<td>10-7M</td>
<td>10-5M</td>
</tr>
<tr>
<td>umbilical vein</td>
<td>10-6M</td>
<td>10-7M</td>
</tr>
<tr>
<td>placental artery</td>
<td>NS</td>
<td>10-6M</td>
</tr>
<tr>
<td>placental vein</td>
<td>10-5M</td>
<td>10-7M</td>
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EP14.27 Outcome comparison of the pregnancies with undetected macrosomia with known macrosomia

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**Setting:** Ipswich Hospital NHS Trust

**Design:** Retrospective observational

**Time period:** February 2016-August 2016

**Method:** We identified singleton babies with birth weight of >90th centile on customised growth chart, diabetic pregnancies excluded. We found number of pregnancies induced for suspected fetal macrosomia. Data was collected from Evolve and patients’ notes. We stratified data into two groups i.e. pregnancies with macrosomic babies antenataly (known) and other where macrosomia was detected (unknown) after birth.

**Results:** In total 212 women, macrosomia was suspected in 139 (known antenataly and 73 (unknown). Majority (99%) in Known group had scan >34 weeks. More women were with BMI>35 (18% vs 8.5%) and primiparous (42% vs 19%) in known group. Mean values for age, parity and BMI were similar.

Induction of labour (IOL) in unknown group was 22% (RR 2.56 [1.62, 4.04]) vs known group (56%). The average birth weight in unknown group was 4201g +/-387 gms. There was no statistical difference in incidence of PPH (3.7% vs 7%, RR=2.36 [0.52, 10.63]) and 3-4th degree perineal tears (5.6% vs 5.5%, RR 1.05 [0.27, 4.08]). Emergency c-section rate was 18% in known vs 11% in unknown group. Instrumental delivery rate was 19% (known) vs 15% (unknown) group.

More trend for shoulder dystocia was seen in the unknown group (7.5% vs 4.4%). The NNU admission rate was 3.7% in unknown group and 12% in known group (RR4.46 [1.06, 18.79]); all except one baby in the known group were delivered after 38 weeks.

**Conclusion:** Results showed that known fetal macrosomia lead to more intervention. Though shoulder dystocia occurred more in unknown group but neonatal admissions were significantly less.

EP14.28 Correlation of various fetal sonographic parameters to the gestational age in early pregnancy

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**Objectives:** To compare the correlation of various fetal sonographic parameters to the gestational age by date or by early dating scan, and to the fetal foot length as a surrogate for gestational age.

**Methods:** The fetal sonographic parameters were retrieved from 35 routine antenatal scans performed at 10 to <15 weeks gestational age by date or by early dating ultrasound scan if there was a discrepancy of more than a week. The correlation coefficients of the fetal sonographic parameters to the gestational age were compared to those derived from fetal foot length. Statistical analysis was performed with Excel, Microsoft office software.

**Results:** The correlation coefficients of fetal ultrasound parameters to gestational age by date or early scan versus fetal foot length were charted. The correlation between the fetal sonographic parameters and the foot length is better than the gestational age by date or early scan. Among all the fetal sonographic parameters, the correlation of