

gestation the Abdominal circumference, TF, FAST and EFW centile were all found to be statistically significant predictors of birthweight. Using backwards stepwise linear regression to find the optimal multivariate model for predicting birthweight a combination of EFW centile and TF were found to be the best predictors. At 37 weeks optimal multivariate model for BW prediction was EFW centile, FAST and TF. The results reveal acceptable reproducibility for fetal mid thigh muscle and fat for a single operator and between operators.

**Conclusion** This prospective study provides reference ranges for fetal mid thigh fat and muscle throughout gestation in fetuses with a normal growth velocity. The inclusion of fetal mid thigh fat in the birthweight algorithm improves the predictive power of birthweight estimation at 28 weeks and 37 weeks. This information is important to explore the role of fetal mid thigh in the detection of fetal IUGR at point estimations of EFW within normal centiles.

#### PF.13 FETAL ECHOGENIC BOWEL: AN 18-YEAR REVIEW FROM THE WESSEX REGION

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**Background** Echogenic bowel is a non-specific marker on antenatal ultrasound and is associated with a variety of underlying diagnoses and adverse fetal outcomes.

**Objectives** To evaluate fetal outcomes where echogenic bowel was identified on second trimester antenatal ultrasound.

**Method** Retrospective study of cases of echogenic bowel identified from the Fetal Medicine and Wessex Antenatally Detected Anomalies (WANDA) register between 1994 and 2012.

**Results** A total of 471 cases of echogenic bowel were identified over the 18-year period, of which 401 (85%) were isolated.

Outcomes were available for 367 (91.5%) cases. 322 (80.2%) pregnancies resulted in a live birth, 21 (5.2%) had termination of pregnancy and 19 (4.7%) were complicated by intra-uterine demise. There were four (1.0%) neonatal deaths.

Post-natal diagnosis was available for 358 (89.2%) cases, of which 259 (72.3%) were healthy, live-born infants. Cystic fibrosis and congenital cytomegalovirus infection was reported in ten (2.8%) and five (1.4%) respectively. Chromosomal abnormalities were present in 21 (5.9%), with Trisomy 21 the most prevalent 15 (4.2%). Intra-uterine growth restriction complicated 17 (4.8%) pregnancies. There were seven cases of intestinal atresia (2%).

**Conclusions** In our cohort the majority of cases had a good outcome and no postnatal abnormality. However the increased incidence of cystic fibrosis, chromosomal abnormalities and congenital infection highlights the importance of investigating this group. The prevalence of growth restriction advocates the consideration of serial growth ultrasound. These findings are useful in the counselling of parents and antenatal management following the identification of isolated echogenic bowel.

#### PF.14 ISOLATED BORDERLINE FETAL CEREBRAL VENTRICULOMEGALY – ROLE OF MAGNETIC RESONANCE IMAGING (MRI)

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**Objective** To examine the role of third trimester magnetic resonance imaging (MRI) in fetuses diagnosed with isolated borderline cerebral ventriculomegaly at the routine second trimester fetal anomaly scan.

**Methods** This was a retrospective cohort study of 159 fetuses with apparently isolated borderline ventriculomegaly (9–12 mm) diagnosed at the routine second trimester ultrasound scan at a median of 22 (range 19–24) weeks' gestation and no additional findings at a repeat scan 6–8 weeks later. Follow up cerebral MRI was carried out at 28–34 weeks and the number of cases in which this investigation demonstrated abnormal findings was calculated. The patients were examined in a tertiary fetal medicine unit between 2005 and 2012.

**Results** In 7 (4.4%) of the 159 cases the MRI scan demonstrated findings not seen by ultrasound. These included partial agenesis of the corpus callosum (n = 2), delayed sulcation disorders (n = 1), heterotopia (n = 2), germinal matrix haemorrhage (n = 1), and destruction of the septum pellucidum (n = 1).

**Conclusions** In about 4% of fetuses with apparently isolated borderline cerebral ventriculomegaly an MRI scan demonstrates potentially clinically significant pathological findings.

#### PF.15 EXPECTANT MANAGEMENT OF MONOCHORIONIC DIAMNIOTIC TWINS WITH SELECTIVE INTRAUTERINE GROWTH RESTRICTION

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We sought to evaluate the outcomes in a cohort of MCDA twins with a diagnosis of selective intra-uterine growth restriction (sIUGR) who were managed expectantly.

This prospective multicenter cohort study recruited 1,028 unselected twin pairs over 2 years in Ireland. Monochorionic twins underwent fortnightly ultrasonographic surveillance from 16 weeks. The defining criterion for sIUGR was an estimated fetal weight less than the 10<sup>th</sup> centile in one twin with an appropriately grown co-twin. Details of the prenatal course, delivery timing and perinatal outcomes were recorded.

Outcome data were recorded for 100% of the 1,001 twin pairs that completed the study (n = 200 monochorionic). Five percent (n = 10) of the MCDA twin pregnancies were diagnosed with sIUGR at a median gestation of 30 weeks (range 26 – 35 weeks). AEDF or REDF was identified in two of these cases. The median time interval from diagnosis to delivery was 36.8 days (range 3 – 66 days) at a mean gestation of 34.2 weeks (range 26 – 37.9 weeks). 70% of the affected twins were admitted to the NICU with a mean stay of 19 days. There were no perinatal mortalities recorded.

Our findings demonstrated excellent outcomes for our cohort of MCDA twins complicated by selective IUGR. There was no single IUFD and in turn there was no morbidity conferred to the appropriately grown co-twin. Close surveillance with regular ultrasonography and Doppler evaluation was essential and allowed continuation of the majority affected pregnancies to a late gestational age, thereby optimising outcome for both twins.

#### PF.16 MATERNAL PLASMA AND AMNIOTIC FLUID CYTOKINES IN MONOCHORIONIC TWIN PREGNANCIES COMPLICATED BY TWIN-TO-TWIN TRANSFUSION SYNDROME

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**Objectives** To investigate the maternal plasma and amniotic fluid (AF) cytokine concentrations in twin pregnancies complicated by TTTS and the effects of fetoscopic laser ablation (FLA).

**Methods** A prospective cohort of MC twins complicated by severe TTTS (n = 23) were studied, between October 2006 and December 2007. Cytokines (TH1: interferon-gamma (IFN- $\gamma$ ), tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ) and interleukins (IL-2, IL-6, IL-8, IL-12, IL-1 $\beta$ ); TH2: IL-4, IL-5, IL-10 and IL-13; as well as keratinocyte growth factor (KGF), platelet derived growth factor-BB (PDGF-BB), fibroblast growth factor-basic (FGF-basic), tissue inhibitor of metalloproteinases-1 (TIMP-1) and intercellular adhesion molecule-1 (ICAM-1) were measured in plasma and AF before and after FLA by Human TH1/TH2/Human Angiogenesis FASTQuant kits or ELISA.

**Results** There was a significant difference in the plasma PDGF-bb and TIMP-1 concentrations noted between uncomplicated MC and MC twin pregnancies complicated by TTTS. Median maternal plasma PDGF-bb was lowest in uncomplicated MC twins than in TTTS pregnancies and DC twin pregnancies pg/ml) ( $P = 0.0486$ ). However, TIMP-1 was higher in TTTS pregnancies than in uncomplicated twins ( $P = 0.0031$ ). There was a significant difference between plasma and amniotic fluid concentrations of IL-6, IL-1 $\beta$ , TNF- $\alpha$ , IL-10, IL-4, IL-8, IFN- $\gamma$ , TIMP-1 and ICAM-1. There were no significant differences in either plasma or amniotic fluid cytokines after fetoscopic laser ablation.

**Conclusion** TTTS is associated with minimal changes in cytokine levels although the majority of cytokine levels were higher in amniotic fluid than maternal blood. It does not appear that FLA provokes a significant cytokine response.

#### PF.17 FETAL BIOMETRY REVISITED

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**Objective** To construct fetal biometric charts in the Irish population using methodology recommended by Altman and Chitty with up-to-date ultrasound equipment.

**Study design** This was a prospective, cross-sectional study involving low-risk women attending Cork University Maternity Hospital. Women were recruited from their first trimester dating scan and randomly allocated to a single scan between 14–40 weeks gestation. Scans were performed by a sole researcher. Gestation was calculated using the estimated-due-date (EDD) by dating scan. Recruits were Irish Caucasian women with a singleton pregnancy. Women with conditions affecting fetal size including hypertension, pre-eclampsia, renal disease, autoimmune disorders and diabetes mellitus were excluded as were fetuses with congenital anomalies. Biometrical measurements were performed using the Voluson E8 ultrasound by GE Healthcare.

**Results** Nine-hundred-and-fifteen women were recruited. Seven-hundred-and-ninety-three women met the inclusion criteria and were scanned as per protocol. Median maternal age was 32 (range 17–44). Median BMI was 24.7 (range 17.1–48.6). Nulliparous women constituted 46.5% (369/793) of recruits, 32.6% (261/793) were expecting their second child, 18.3% (145/793) were expecting their third or fourth child, while only 2.3% (18/793) were grand multiparous. Biometric charts for biparietal diameter (BPD), head circumference (HC), femur length (FL) and abdominal circumference (AC) have been generated for this population and compared to the biometric charts by Chitty *et al*. Following is a table showing calculated percentiles for BPD measurements in this population.

**Conclusion** We have constructed Irish Caucasian specific fetal biometry charts with up-to-date equipment using Chitty and Altman's methodology.

#### PF.18 UMBILICAL ARTERY DOPPLERS IN A LOW RISK POPULATION

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**Objective** To construct reference intervals for umbilical artery Doppler indices from 15 to 40 weeks in a low-risk population.

**Study design** This was a prospective, cross-sectional study involving low-risk women attending Cork University Maternity Hospital conducted concurrently with a primary study to construct normograms for fetal biometry. Women were recruited from their first trimester dating scan and randomly allocated to a single scan between 14–40 weeks gestation. Scans were performed by a sole researcher. Gestation was calculated using the estimated due date assigned by dating scan. Recruits were Irish Caucasian women with a singleton pregnancy. Women with conditions affecting placental function including hypertension, pre-eclampsia, renal disease, autoimmune disorders and diabetes mellitus were excluded as were fetuses with congenital anomalies. Umbilical artery Dopplers were sampled using the Voluson E8 ultrasound by GE Healthcare.

**Results** Nine-hundred-and-fifteen women were recruited. Seven-hundred-and-ninety-three women met the inclusion criteria and were scanned as per protocol. Women in gestational week 14 were not included in this dataset due to technical difficulties and presence of absent end diastolic flow. Median maternal age was 32 (range 17–44). Median BMI was 24.7 (range 17.1–48.6). Nulliparous women constituted 46.5% (369/793) of recruits, 32.6% (261/793) were expecting their second child, 18.3% (145/793) were expecting their third or fourth child, while only 2.3% (18/793) were grand multiparous. Reference intervals for umbilical artery resistance index (RI), pulsatility index (PI) and systolic/diastolic (S/D) ratio were generated for this population. The following table shows the calculated percentiles for each gestational week.

**Conclusion** We have constructed Irish Caucasian specific reference intervals for umbilical artery Doppler indices from 15 to 40 weeks in a low-risk population using up-to-date ultrasound equipment.

#### PF.19 NEONATAL ICU ADMISSIONS OF CHILDREN CONCEIVED FOLLOWING ASSISTED REPRODUCTIVE TECHNOLOGY

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The purpose of this project was to compare NICU admission rates of children conceived via assisted reproductive technology with that of the naturally conceived population.

A retrospective cohort study was constructed using a consent-based registry to identify and follow-up children born via ART. Register and NICU admission records were linked and comparisons made (with allowance for confounding) between admission rates in the naturally conceived population and the ART cohort by logistic regression. The project was performed in accordance with HFEA regulations and had ethical approval.

#### Abstract PF.19 Table

	Singletons		Twins	
	OR (95% CI)	P Value	OR (95% CI)	P Value
Unadjusted	0.92 (0.71, 1.18)	0.49	0.83 (0.69, 0.99)	0.04
Adjusted for hospital	0.95 (0.74, 1.22)	0.69	0.85 (0.71, 1.03)	0.09
Adjusted for year	0.91 (0.71, 1.17)	0.47	0.83 (0.69, 0.99)	0.04
Adjusted for hospital and year	0.95 (0.74, 1.22)	0.66	0.85 (0.70, 1.02)	0.08
Adjusted for gestation	0.62 (0.45, 0.84)	0.002	0.71 (0.57, 0.90)	0.004
Adjusted for hospital, gestation and year	0.68 (0.49, 0.93)	0.02	0.76 (0.60, 0.97)	0.03

NICU admission rates of singleton infants conceived following ART were significantly lower than their naturally conceived peers when adjusted for combinations of hospital with gestation and year. Unadjusted admission rates for singletons were not different.