PF.09 CHROMOSOMAL MICROARRAY (CMA) USE FOR THE PRENATAL DETECTION OF CHROMOSOME ANOMALIES: MODEL-BASED HEALTH ECONOMIC EVALUATION

doi:10.1136/archdischild-2013-303966.021

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Chromosomal microarray (CMA) technology is increasingly used to detect chromosomal anomalies in the prenatal setting. Although its increased detection rates over karyotyping has been proven the cost-effectiveness is yet to be established.

A decision tree was built and populated using two data sets; that of the literature from 21 journal articles and 13755 fetal samples where there was a range of indications for testing and data from 17 cohorts where the indication for testing was abnormalities on fetal ultrasound scan, 4276 fetal samples are included. Costs included were those incurred by the West Midlands Genetics laboratory. Staff costs were taken from Unit costs of health and social care 2011.

When the base case cost of CMA is £405 and there is a range of indications for performing testing, CMA will cost an extra £6800 per case detected over karyotyping. CMA will cost an extra £2600 over karyotyping per case detected when the indication is abnormal ultrasound scan. Threshold analysis shows that when the cost of CMA is reduced to £220 it becomes the cost-effective option. Cost effectiveness association curves show that for any referral indication when the willingness to pay is >£7500 and for abnormal scans when the WTP is >2830 the probability of CMA being cost effective is over 95%.

CMA will become the cost effective option of the future as technology costs fall. At the present time for abnormal ultrasound scan CMA may be considered if the WTP per case detected is £2600 in addition to standard costs.

PF.10 THE PLUTO STUDY: EVALUATION OF THE EFFECTIVENESS OF PERCUTANEOUS VESICOAMNIOTIC SHUNTING (VAS) FOR LOWER URINARY TRACT OBSTRUCTION (LUTO), A COMPARISON OF RCT AND REGISTRY DATA

doi:10.1136/archdischild-2013-303966.022

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Objective RCT and registry to determine effectiveness of VAS in LUTO for survival and renal function.
Setting Fetal Medicine departments (England, Scotland, Ireland, Netherlands).
Participants Pregnant women with singleton, male fetus with isolated LUTO.
Design RCT with registry. Intervention - VAS compared to conservative care.
Main Outcome Measures Perinatal mortality and serum creatinine at 6 weeks of age and 1 year. Prognostic value of gestational age and liquor volume at diagnosis were assessed in a logistic regression analysis using data from registry and RCT.
Results RCT survival to 28 days favoured VAS: intention-to-treat relative risk 1.88, 95%CI: 0.71 to 4.96 (50% v 27%, p = 0.27); registry favoured conservative management: relative risk 0.58, 95%CI: 0.26, 1.29 (40% v 69%, p = 0.14). Those women who entered the registry and had conservative management were more likely to have a normal liquor volume at diagnosis (>5th centile) than those receiving VAS (p = 0.04) or those randomised (p = 0.03). They also had a higher proportion with gestational age at diagnosis >24 weeks compared with those randomised (p = 0.002). These variables were strongly associated with improved survival to 28 days in a multivariate logistic regression analysis. There was also a difference in the pathological diagnoses made postnatally in the conservative group in the registry with a 5/21 (24%) of babies with a **false positive** antenatal diagnosis of LUTO.
Conclusion Normal liquor volume (>5th centile) and age at diagnosis > 24 weeks seem to be associated with increased probability of survival at 28 days in fetuses with confirmed LUTO.

PF.11 ABNORMAL PLATELET FUNCTION IS SEEN IN WOMEN WITH UNEXPLAINED RECURRENT MISCARRIAGE DURING PREGNANCY

doi:10.1136/archdischild-2013-303966.023

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Objective To evaluate platelet aggregation in patients with a history of recurrent miscarriage (RM) during a subsequent successful pregnancy and compare them to healthy pregnant controls.
Study design A prospective longitudinal study was performed to compare platelet function in 30 patients with a history of three consecutive unexplained first trimester pregnancy losses and 30 healthy age-matched pregnant controls. Exclusion criteria included the use of anti-platelet medications such as aspirin and medical conditions that can affect platelet function. Light transmission aggregometry was used to assay platelet agonists at different times and concentrations to create dose-response curves.
Results In contrast, to the increased platelet aggregation response seen in healthy controls, platelet reactivity in patients with RM peaked at 12–14 weeks gestation, highlighted by the increased aggregation response to epinephrine (p = 0.0008) and collagen (p < 0.0001) and then decreased in the third trimester in response to epinephrine (p < 0.0001), arachidonic acid (p < 0.0001) and Thrombin Receptor Activating Peptide (p < 0.0001).
Conclusion Patients with a history of recurrent miscarriage have significantly different platelet function when compared to healthy controls, in particular during the first trimester. Knowledge of which patients have impaired platelet function may allow for more targeted therapy in the setting of recurrent miscarriage.

PF.12 LONGITUDINAL DATA ON FETAL THIGH SOFT-TISSUE PARAMETERS AND ITS ROLE IN THE PREDICTION OF BIRTHWEIGHT

doi:10.1136/archdischild-2013-303966.024

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Objective To profile longitudinal changes in the fetal mid thigh muscle and subcutaneous tissue measurements in fetuses with a normal growth velocity in euglycemic pregnancies and evaluate the association between mid thigh parameters and birthweight.
Methods A prospective longitudinal study of 351 singleton fetuses in euglycemic pregnancies. Reliability of fetal abdominal subcutaneous tissue (FAST) measurements and mid thigh indices including thigh muscle (TM) and thigh fat (TF) between two operators was also reviewed.
Results The FAST and fetal mid thigh muscle and fat in AGA fetuses show a significant increase with gestational age. At 28 weeks

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

doi:10.1136/archdischild-2013-303966.025

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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%). Intrauterine 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)

doi:10.1136/archdischild-2013-303966.026

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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

doi:10.1136/archdischild-2013-303966.027

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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 10th 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

doi:10.1136/archdischild-2013-303966.028

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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).