

**Methods:** Routine two dimensional fetal scans were performed in 123 consecutive singleton pregnancies during the second half of pregnancy. General Electric E8 ultrasound equipment was used in all cases.

Mechanical PR interval was measured from the onset of the mitral A wave to the onset of the aortic ejection flow, using previously described technique for standard and modified Tei index. All measurements were taken twice by two different operators. For statistical analysis mean and standard deviation was used position measurement. For comparison between two groups and the inter observer agreement Least square analysis was performed.

**Results:** The mechanical PR interval was easily obtained in all 123 cases. The mean gestational age was 25.5 weeks (18–38 weeks). The PR interval was 117,97ms (SD: 9.49 msec), in standard Tei index group, and 119,11ms. (SD: 10.71 msec) in modified Tei index group. There was a positive correlation between PR interval and gestational age (COV 2.48). There was no significant difference between both groups (t student 99%:261 > t calculated -0,068). Difference between Inter observer was not significant (t student 99%: 2,61 > t calculated -0.087).

**Conclusion:** The pulsed Doppler assessment using standard and modified Tei index approach of the mechanical PR interval in the fetus, is a feasible and could be used to explore the fetal atrioventricular conduction abnormalities. It is reproducible and easily obtained during the routine second half of gestation and the normal range is similar to that described with other methods.

#### OC06.06

##### Fetal myocardial performance (Tei) index and left ventricular shortening fraction (LVSF)

D. C. Wood, M. Bisulli, S. Ashraf, S. Wang, A. Modena, B. Wood, R. Larkin, R. Librizzi, J. Baxter, V. Berghella, S. Weiner

*Obstetrics and Gynecology, Thomas Jefferson University, Philadelphia, PA, USA*

**Objective:** We sought to compare two methods of estimation of fetal myocardial function across gestation from our database of normal fetuses.

**Methods:** In a retrospective cross sectional study, we compared left ventricular shortening fraction (LVSF) from m-mode ultrasound and pulsed Doppler ultrasound timing of flow patterns from the left ventricular outflow tract to determine the myocardial performance (Tei) index. The LVSF was calculated from the formula: LVDD-LVSD/LVDD. All measurements were taken in the lower third of the LV below the mitral valve when the m-mode line of insonation was perpendicular to the ventricular septum. The Tei index measured the specific systolic time intervals created by the movement of the anterior leaflet of the mitral valve and the aortic valve leaflets within the pulsed Doppler sample placed over and parallel to flow in the LV outflow tract. The Tei index utilized the “clicks” method where the spike artifacts (clicks) in the Doppler signal were used to measure isovolumetric contraction time (ICT), systolic ejection time (LVET) and isovolumetric relaxation time (IRT). The Tei index was determined from the formula: ICT + IRT/ LVET.

**Results:** 3200 fetal echocardiograms performed over a 4 year period were available for review of the LV function parameters of LVSF and Tei index. Normal LVSF from m-mode measurements across gestation remains linear and constant from 11 weeks until term at 0.41 (+/- 0.12). LV myocardial performance using the TEI index increases in a linear fashion over gestation from 11 weeks gestation to term from 0.4 to 0.58 (+/- 0.05).

**Conclusions:** The LVSF in fetuses has been the standard method of functional evaluation, but numbers may vary from center to center based on the interpretation of where to measure the systolic and diastolic dimensions and may have a wide standard deviation at various fetal ages. The Tei index using the “clicks” method in the same cohort of patients appears to have a tighter standard deviation and may be more reproducible.

#### OC06.07

##### Changes in fetal ductus arteriosus dynamics following restriction of polyphenol-rich foods in late pregnancy

P. Zielinsky, L. H. Nicoloso, A. L. Piccoli, J. L. Manica, D. Saldanha, J. L. Pereira, I. Vian, L. P. Bender, M. R. Moraes, J. Silva, L. N. Aita, P. Pizzato

*Fetal Cardiology Unit, Institute of Cardiology, Porto Alegre, Brazil*

**Objective:** Since we have previously demonstrated that maternal ingestion of polyphenol-rich foods (herbal teas, dark chocolate, grape and orange juices, berries, and others) may cause fetal ductal constriction by inhibition of prostaglandin synthesis, we tested the hypothesis that ductus arteriosus dynamics improves in third trimester fetuses whose mothers are submitted to a flavonoid-poor diet for a period superior to two weeks.

**Methods:** 46 fetuses above 28 weeks of gestation were submitted to two Doppler echocardiographic studies with an interval of at least two weeks. Ductal velocities (DV) (systolic and diastolic), ductal pulsatility index (PI) and right to left ventricular dimensions ratio (RV/LV) were assessed. In the first evaluation, the examiners were blinded to maternal dietary habits. After the echocardiographic study, a detailed food frequency questionnaire based on validated instruments was applied and a diet based on flavonoid-poor foods (less than 30 mg/100g of food) was recommended. T test for independent samples was used, with a critical  $p < 0.05$ .

**Results:** Mean gestational age was  $33 \pm 3$  weeks (28–38 weeks). Mean daily maternal estimated flavonoid intake was 1277 mg. After dietary orientation, mean daily flavonoid consumption decreased to 126 mg ( $p = 0.0001$ ). Comparing the two echocardiographic studies, significant decreases in DV and RV/LV ratio and increase in ductal PI were observed [systolic velocity =  $1.2 \pm 0.4$  m/s (0.7–1.7) to  $0.9 \pm 0.3$  m/s (0.6–1.3) ( $p = 0.018$ ); diastolic velocity =  $0.21 \pm 0.09$  m/s (0.15–0.38) to  $0.18 \pm 0.06$  m/s (0.11–0.25) ( $p = 0.016$ ); RV/LV =  $1.3 \pm 0.2$  (0.9–1.5) to  $1.1 \pm 0.2$  (0.8–1.4) ( $p = 0.004$ ); ductal PI =  $2.2 \pm 0.3$  (1.6–2.7) to  $2.4 \pm 0.4$  (1.9–2.9) ( $p = 0.04$ )].

**Conclusion:** A flavonoid-rich diet during third trimester may interfere with fetal ductal flow dynamics, this effect being reversed by decreasing maternal intake of these foods.

#### OC07: EARLY PREGNANCY: MISCARRIAGE AND GROWTH

##### OC07.01

##### A new crown-rump length curve based on over 3500 pregnancies

A. Pexsters<sup>1</sup>, A. Daemen<sup>2</sup>, C. Bottomley<sup>3</sup>, D. Van Schoubroeck<sup>1</sup>, L. De Catte<sup>1</sup>, B. De Moor<sup>2</sup>, T. D’Hooghe<sup>1</sup>, C. Lees<sup>4</sup>, D. Timmerman<sup>1</sup>, T. Bourne<sup>1,5</sup>

<sup>1</sup>Obstetrics and Gynaecology, UZ Gasthuisberg, KU Leuven, Leuven, Belgium; <sup>2</sup>Electrical Engineering (ESAT), Catholic University Leuven, Leuven, Belgium; <sup>3</sup>Obstetrics and Gynaecology, St George’s, University of London, London, United Kingdom; <sup>4</sup>Obstetrics and Gynaecology, Addenbrookes Hospital, Cambridge University Hospitals NHS Foundation Trust, Cambridge, United Kingdom; <sup>5</sup>Obstetrics and Gynaecology, Imperial College London, Hammersmith Campus, London, United Kingdom

**Objective:** The Robinson and Hadlock curves that are used to estimate gestational age (GA) based on the crown-rump length (CRL) of an embryo or fetus have limitations. The aim of this study was to create a new normal CRL curve. We compared this to the existing curves.

**Methods:** A retrospective study of CRL in the first trimester was conducted in a fetal medicine referral center with a predominantly

Caucasian population. A mixed-effects analysis was performed to determine the relationship between CRL and GA. After internal validation, the CRL was compared to the expected CRL at a given gestational age according to the Robinson and Hadlock models and was expressed as a z-score. Bland–Altman plots were constructed to compare the new CRL curve with both curves.

**Results:** 3710 normal singleton pregnancies with a known last menstrual period were included, corresponding to 4387 scans. Compared to the CRL curve, Robinson gave a 4 day underestimation of GA at 6 weeks with a difference in CRL of 3.75mm and a 1 day overestimation from 11 to 14 weeks with a difference in CRL of 2mm. Comparison with the Hadlock curve shows a difference in CRL equivalent to an underestimation of 2 days at 6 weeks and a difference of CRL equivalent to an overestimation of 2 days at 14 weeks. At 9 weeks all the curves are similar.

**Conclusion:** The new CRL curve shows significant differences with the Robinson and Hadlock curves at the beginning and the end of the first trimester.

#### OC07.02

##### The prevalence of uterine anomalies and their impact on early pregnancy in women undergoing assisted reproduction treatment

K. Jayaprakasan, J. Clewes, S. R. Deb, Y. Chan, C. Sjoblom, N. Raine-Fenning

*School of Clinical Sciences, Division of Human Development, University of Nottingham, Nottingham, United Kingdom*

**Objective:** To estimate the prevalence of congenital uterine anomalies in subfertile women and to evaluate their influence on early pregnancy following assisted reproduction treatment (ART).

**Material and methods:** We prospectively recruited 1392 subjects undergoing ART over a period of 5 years from 2004–2009. 3D TVS was performed in the early follicular phase of the menstrual cycle (day 2–5) and repeated in the late follicular phase (day 10–14) if the shape of the uterine cavity could not be assessed in the first scan. A subset of the subjects who conceived after ART were followed up to 12 weeks of gestation. The miscarriage rate among women known to have uterine anomalies was compared with that experienced by women having normal uterine shape by the Chi-square test.

**Results:** 1385 subjects were included for final analysis after excluding seven subjects who had fibroids distorting the uterine cavity. Whilst 1201 (86.7%) subjects had a normal uterine cavity, uterine anomalies were demonstrated in 184 (13.3%) subjects. Arcuate uteri represented the commonest anomaly (n=164; 11.8%) followed by septate (n=7; 0.5%), subseptate (n=5; 0.4%), unicornuate (n=6; 0.4%), bicornuate (n=1; 0.1%) and T-shaped uteri (n=1; 0.1%). A total of 440 subjects who underwent ART have been followed up: 57% of subjects (43/76) with uterine anomalies and 43.4% matched controls (158/364) with normal uteri conceived. First trimester miscarriage was comparable between the groups: 18.6% (8/43) of those with uterine anomalies compared to 12.7% (20/158) in the controls (P=0.32). The miscarriage rates associated with the arcuate uteri was 13.9% (5/36).

**Conclusions:** Women who are referred for ART have a high prevalence of congenital uterine anomalies, the most common anomaly being an arcuate uterus. However, the first trimester miscarriage does not appear to be increased in these women although this needs to be evaluated in a much larger population.

#### OC07.03

##### The use of power Doppler colour scoring to predict successful expectant management in women with an incomplete miscarriage

I. V. Casikar<sup>1,2</sup>, J. Riemke<sup>1,2</sup>, T. Bignardi<sup>1,3</sup>, D. Alhamdan<sup>1,2</sup>, C. Lu<sup>1</sup>, G. Condous<sup>1,3</sup>, M. Mongelli<sup>1,3</sup>

<sup>1</sup>Early Pregnancy, Acute Gynaecology and Advanced Endosurgery Unit, Nepean Hospital, Penrith, NSW, Australia; <sup>2</sup>Nepean Centre for Perinatal Care, Nepean Hospital, Penrith, NSW, Australia; <sup>3</sup>Nepean Clinical School, Nepean Hospital, Penrith, NSW, Australia

**Objectives:** To evaluate the association between power Doppler scores of retained products and subsequent successful expectant management in women with incomplete miscarriage.

**Methods:** Prospective observational study in the Acute Gynaecology Unit (AGU) at Nepean Hospital from November 2006 to February 2009. All women with an incomplete miscarriage managed expectantly were included in the study. Subjective power Doppler colour scoring (PDCS) of the retained tissue was performed. The vascularization of the retained products was scored using the colour scoring system of IOTA. The correlation between the PDCS and successful expectant management of miscarriage was analysed.

**Results:** 1395 consecutive pregnant women underwent transvaginal ultrasound. 198 women were diagnosed with an incomplete miscarriage. 172 were managed expectantly. Complete data was available on 158 cases. In total 84.8% (134/158) were managed successfully whilst 15.2% (24/158) failed expectant management. 89% (121/136) of women with a PDCS 1 had successful expectant management compared to 57.1% (8/14) with PDCS 2 and 62.5% (5/8) with PDCS 3. Comparing absence of flow (PDCS 1) to the presence of flow (PDCS 2 or more), the rate of success was significantly higher in the first group (89% vs. 60.9%, Fisher Exact test p=0.00136) (see Table 2). In the prediction of success, the absence of flow showed a sensitivity specificity, PPV, NPV and positive likelihood ratio of 90.3%, 37.5%, 89.0%, 40.9% and 1.445 (95% C.I. 1.055–1.979), respectively.

**Conclusion:** The absence of flow on power Doppler is associated with a significant improvement in successful expectant management. This new approach to incomplete miscarriage may be helpful in quantifying the chances of successful expectant management at the first scan.

OC07.03: Absence of flow vs. presence of flow at Power Doppler Colour assessment

Power Doppler colour score	Expectant management success	Expectant management failure
1	121 (89%)	15 (11%)
2–4	13 (60.9%)	9 (39.1%)

#### OC07.04

##### The value of assessment of patient history and pain and bleeding scores prior to early pregnancy transvaginal ultrasound assessment

C. Bottomley<sup>1</sup>, V. Van Belle<sup>3</sup>, E. Kirk<sup>2</sup>, D. Timmerman<sup>4</sup>, T. Bourne<sup>2,4</sup>

<sup>1</sup>St George's University of London, London, United Kingdom; <sup>2</sup>The Hammersmith Hospital, Imperial College London, London, United Kingdom; <sup>3</sup>Department of Electrical Engineering (ESAT), Katholieke Universiteit Leuven, Leuven, Belgium; <sup>4</sup>University Hospitals, Katholieke Universiteit Leuven, Leuven, Belgium

**Objective:** Women commonly present in early pregnancy with pain, bleeding or anxiety. Our objective was to analyse detailed demographic, prior obstetric and symptom details to determine how well the likelihood of ongoing viability can be determined prior to transvaginal ultrasound (TVS).