maternal or perinatal complication occurred in women delivered within 48 h of diagnosis or in women diagnosed postpartum.

**Conclusions** HELLP syndrome is associated with severe maternal and perinatal morbidity. Expectant management is rarely used in the UK.

**PM.02** EFFECT OF 1,25-DIHYDROXYVITAMIN D3 (1,25-D3) ON EXTRAVILLIOUS TROPHOBLAST INVASION IN VITRO

doi:10.1136/archdischild-2013-303966.087

1SY Chan, 1D Cavonas, 1V Vasiliopoulou, 1LS Loubiere, 2O Ohizu, 1M Hewison, 1MD Kilby, 1University of Birmingham, Birmingham, UK; 2Walsall Hospitals NHS Trust, Walsall, UK; 1UCLA Orthopaedic Hospital, Los Angeles, United States of America

**Introduction** The invasion of maternal tissues by extravillous trophoblast (EVT) plays a central role in normal placentation. Inadequate EVT invasion is characteristic of pre-eclampsia, which is associated with low maternal circulating concentrations of 25-hydroxyvitamin D3 (25-D3). Furthermore, trophoblasts from pre-eclamptic placenta demonstrate lower 1α-hydroxylase activity, which converts 25-D3 to the active ligand, 1,25-D3. We thus hypothesise that reduced vitamin D action leads to malplacentation and increased pre-eclampsia risk. To elucidate the mechanistic link we determined whether 1,25-D3 has a regulatory effect on EVT invasion.

**Methods** Primary EVT cells were isolated from first trimester (9–11 weeks) human placentae (n = 5) following surgical termination of pregnancy. Isolated EVT, and in separate experiments, SGHPL4 (EVT-like cell line) were placed in 8-mm inserts coated with reduced growth factor Matrigel® and treated with increasing concentrations of 1,25-D3 (0.0.1.1.10 nM). EVT invasion was quantified by counting all the invaded cells visualised with Mayer’s haematoxylin and eosin at 48 hours. A proliferative response to 1,25-D3 was assessed by MTT assays.

**Results** 1,25-D3 promoted EVT invasion in a dose-dependent manner peaking at a dose of 1 nM. EVT exposed to 0.1 nM and 1 nM concentrations showed a 1.9-fold (p < 0.05) and 2-fold (p < 0.01) increase respectively in the numbers of invaded cells compared with untreated controls. Treatment with 10 nM 1,25-D3 induced a 10-fold (p < 0.05) increase in invasion by SGHPL4 cells compared with 0 nM but did not affect proliferation.

**Conclusion** This is circumstantial evidence that Vitamin D supplementation during pregnancy may potentially reduce the risk of developing pre-eclampsia as 1,25-D3 promotes EVT invasion.

**PM.03** RELATIONSHIP BETWEEN FETAL GROWTH, CARdiovascular ADaptation AND BIRTH WEIGHT

doi:10.1136/archdischild-2013-303966.088

1AA Mahendru, 1TR Everett, 2CM McEniery, 2IB Wilkinson, 2CC Lees. 1Fetal Medicine Department, Addenbrooke’s Hospital, Cambridge University Hospital NHS Foundation Trust, Cambridge, UK; 2Clinical Pharmacology Department, University of Cambridge, Cambridge, UK

Maternal cardiovascular adaptation in pregnancy is necessary for optimal fetal growth. The objective of this study was to explore the relationships between growth rate, fetal size at 10–14 weeks, birth weight and maternal cardiovascular adaptation in pregnancy.

This was a prospective study of 143 women planning to conceive. Crown rump length (CRL) was measured in 71 viable pregnancies at 6–7, 8–9 and 10–14 weeks in 1st trimester and biometry was performed at 22–24 and 32–34 weeks. First and 2nd to 3rd trimester growth rates were calculated. Cardiovascular assessments were performed pre-pregnancy; at 6–7 weeks, in 2nd and 3rd trimesters. We examined the relationships between 1st trimester CRL growth rate, CRL z-score at 10–14 weeks, 2nd to 3rd trimester fetal growth rate, birth weight z-score and cardiovascular adaptation.

First trimester fetal growth and CRL z-score were not related to 2nd to 3rd trimester fetal growth rate (P = 0.2, P = 0.4) nor to birthweight z-score (P = 0.5). However, 2nd to 3rd trimester fetal growth rate was positively correlated to birthweight z-score (p = 0.758, P < 0.001). Amongst the maximum cardiovascular changes the pre-pregnancy to 2nd trimester increase in cardiac output (CO) was significantly correlated to birthweight z-score (p = −0.257, P = 0.05).

Pregnancy induced cardiovascular changes by 2nd trimester may ‘drive’ later pregnancy fetal growth and birthweight. Contrary to previous reports based on assumption of growth on a single CRL measurement at 10–14 weeks, birthweight was not related to 1st trimester growth, but was related to 2nd to 3rd trimester fetal growth and maximum increase in CO by 2nd trimester.

**PM.04** CARdiovascular INDICES IN THE EARLY IDENTIFICATION OF PRE-eCLAMPsIA IN WoMEN AT HIGH-RISK FOR HYPERtensional DISORDERS OF PREGNANCY

doi:10.1136/archdischild-2013-303966.089

A Khalil, E Mantovani, A Bhide, B Thilaganathan. St George’s Hospital Medical School, London, UK

**Objective** Biochemical markers such as PI GF have been proposed as point-of-care tests for the early identification of women at risk of hypertensive disorders. The aim of this study was to ascertain whether biophysical markers are similarly predictive for the subsequent development of pre-eclampsia.

**Methods** This was a prospective study of women presenting in the third trimester of pregnancy to the day assessment unit with nonproteinuric hypertension and suspected diagnosis of preeclampsia. Stroke volume index (SVI), cardiac index (CI), systemic vascular resistance index (SVRI), pulse wave velocity (PWV), aortic augmentation index (AIX) and uterine artery Doppler mean pulsatility index (PI) were measured at recruitment. Comparisons of medians between groups were performed using Mann Whitney tests.

**Results** A total of 102 women took part in the study and 42 women developed hypertensive disease in pregnancy. At presentation, compared to those who remained normotensive, women who develop hypertensive disease in pregnancy have significantly higher SVRI (5291 vs 1851 dynes – sec·cm⁻², P < 0.001), aortic AIX (18.0 vs 9.05%, P < 0.001), PWV (8.41 vs 7.70 m/sec, P = 0.005) and uterine artery Doppler mean PI (0.87 vs 0.77, P = 0.044). However they had significantly lower heart rate (79.8 vs 87.3 beat/min, P = 0.006), CI (2.86 vs 3.83 L/min/m², P < 0.001) and SVI (37.5 vs 45.3 mL/m², P = 0.01).

**Conclusion** Women who subsequently develop pre-eclampsia have distinct cardiovascular indices that may help discriminate them from those at high-risk of pre-eclampsia who remain normotensive. It remains to be established whether these indices may be used prospectively, either alone or in conjunction with biochemical markers, for triage and follow-up.

**PM.05** POSTPARtum DYSLipidaemIa IN WOmen DiAGNOSED WITH GESTATIONAL DIABetes MEllitus

doi:10.1136/archdischild-2013-303966.090

1AC O’Higgins, 1V O’Dwyer, 1C O’Connor, 5S Daly, 6T Kinsley, 1MJ Turner. UCD Centre for Human Reproduction, Dublin, Ireland; 2Coombe Women and Infants University Hospital, Dublin, Ireland

**Background** Outside of pregnancy diabetes mellitus is an accepted risk factor for cardiovascular disease which should prompt screening for dyslipidemia in adults.