

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 D<sub>3</sub> (1,25-D<sub>3</sub>) ON EXTRAVILLIOUS TROPHOBLAST INVASION IN VITRO**

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**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 circulatory concentrations of 25-hydroxyvitamin D<sub>3</sub> (25-D<sub>3</sub>). Furthermore, trophoblasts from pre-eclamptic placenta demonstrate lower 1 $\alpha$ -hydroxylase activity, which converts 25-D<sub>3</sub> to the active ligand, 1,25-D<sub>3</sub>. We thus hypothesise that reduced vitamin D action leads to malplacentation and increase pre-eclampsia risk. To elucidate the mechanistic link we determined whether 1,25-D<sub>3</sub> 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- $\mu$ m inserts coated with reduced growth factor Matrigel<sup>®</sup> and treated with increasing concentrations of 1,25-D<sub>3</sub> (0.01, 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-D<sub>3</sub> was assessed by MTT assays.

**Results** 1,25-D<sub>3</sub> 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-D<sub>3</sub> induced a 10-fold (p < 0.05) increase in invasion by SGHPL-4 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-D<sub>3</sub> promotes EVT invasion.

**PM.03 RELATIONSHIP BETWEEN FETAL GROWTH, CARDIOVASCULAR ADAPTATION AND BIRTH WEIGHT**

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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 1<sup>st</sup> trimester and biometry was performed at 22–24 and 32–34 weeks. First and 2<sup>nd</sup> to 3<sup>rd</sup> trimester growth rates were calculated. Cardiovascular assessments were performed pre-pregnancy, at 6–7 weeks, in 2<sup>nd</sup> and 3<sup>rd</sup> trimesters. We examined the relationships between 1<sup>st</sup> trimester CRL growth rate,

CRL z-score at 10–14 weeks, 2<sup>nd</sup> to 3<sup>rd</sup> trimester fetal growth rate, birth weight z-score and cardiovascular adaptation.

First trimester fetal growth and CRL z-score were not related to 2<sup>nd</sup> to 3<sup>rd</sup> trimester fetal growth rate (P = 0.2, P = 0.4) nor to birth-weight z-score (P = 0.5). However, 2<sup>nd</sup> to 3<sup>rd</sup> 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 2<sup>nd</sup> trimester increase in cardiac output (CO) was significantly correlated to birthweight z-score (p = -0.257, P = 0.03).

Pregnancy induced cardiovascular changes by 2<sup>nd</sup> 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 1<sup>st</sup> trimester growth; but was related to 2<sup>nd</sup> to 3<sup>rd</sup> trimester fetal growth and maximum increase in CO by 2<sup>nd</sup> trimester.

**PM.04 CARDIOVASCULAR INDICES IN THE EARLY IDENTIFICATION OF PRE-ECLAMPSIA IN WOMEN AT HIGH-RISK FOR HYPERTENSIVE DISORDERS OF PREGNANCY**

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**Objective** Biochemical markers such as PlGF 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 non-proteinuric 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 (3251 vs 1851 dynes - sec/cm<sup>-5</sup>/m<sup>2</sup>, P < 0.001), aortic AIx (18.0 vs 5.05%, P < 0.001), PWV (8.41 vs 7.70 m/sec, P = 0.003) 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/m<sup>2</sup>, P < 0.001) and SVI (37.5 vs 45.3 mL/m<sup>2</sup>/beat, 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**

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