failure to progress in 25%. Nearly 48% of maternal deaths were after CS. The mortality rate after CS is 208 per 1 000 000 deliveries compared with 48 per 1 000 000 after vaginal delivery.

Grading of CS is very important as it facilitates communication of the degree of urgency between different parts of the team taking care of labouring women (obstetrician, anaesthetist and midwives). It is also a requirement of the Clinical Negligence Scheme for Trusts.

In our audit we looked at the grading of emergency CS (63 cases) in 1 month in a busy general hospital.

When the notes were reviewed there was disagreement about the grading in almost 15% of cases, including grade 1 CS graded as grade 3. It was noted that the surgeons deciding and performing the operation graded only 39% of the cases and the rest were graded by other members of staff, eg, midwives or scrub nurses. Most cases of discrepancy occurred when the surgeon failed to document the grade of CS at the time of decision.

PLD.65 CONSENT FOR CAESAREAN SECTION

L Shanmugasundaram. *Dorset County Hospital Foundation Trust, Dorchester, UK*

Audit of Standards: RCOG consent advice nos 6 and 7 (obtaining valid consent and Caesarean section).
Methods: Retrospective case notes review of 95 written consents in 2007.
Setting: Dorset County Hospital Foundation Trust with 2159 deliveries in 2007 and 24% Caesarean section rate.
Background: Adaptation of the national consent form has been in practice in this trust for consents and women are consented in the antenatal clinic when decision is taken for elective Caesarean. Information pack including Caesarean and pain relief are provided antenatally. However, 57% of the Caesareans in 2007 were emergencies, ie, unplanned.
Findings: Client details were fully entered in 65%, with duplicate copy having no client details in 24%, the rest were only partly complete. The procedure was not entered in 7%. Complications outlined in >90% were bleeding, infection; >80% for organ damage, thromboembolism; 3% for future pregnancy implications. Two cases with placenta praevia did not have documentation of hysterectomy risk. Client's copy of the consent form was given to the client in 24%. Documentation of information leaflets provided in 3%.
Conclusions: Improved documentation was required. Despite RCOG guidelines, NICE guidelines and our hospital guidelines, there is a need to improve consent content. Some of the shortcomings can be due to pressure of time during clinic appointments and in emergency Caesareans.
Recommendations: Pre-printed Caesarean consent with local adaptation from NICE Caesarean guideline and RCOG guideline to be implemented. Theatre checklist amended to include client copy to be given to client by surgeon after revalidating.

PLD.66 VAGINAL BIRTH AFTER CAESAREAN SECTION: OUR EXPERIENCE AT A DISTRICT GENERAL HOSPITAL IN EAST LONDON

V Thakur, O Olawu, R Wuntakal, B Dawaltly, D Visvanathan, G Benchetrit. *Whipps Cross University Hospital, London, UK*

Introduction: In a busy district hospital that caters for a high-risk and multi-ethnic population Caesarean section rates are rising and this has led to an increased proportion of the obstetric population with previous Caesarean section.
Aim: To review care of women undergoing planned vaginal birth after Caesarean section (VBAC) and compare it with the RCOG green top guidelines on birth after previous Caesarean section.
Methods: A retrospective audit from January 2007 to December 2007. We identified women undergoing planned VBAC from the labour ward database. The case notes were reviewed for documented discussion of risks and benefits of VBAC and elective Caesarean section, grade of doctor involved in counselling, care of these women in labour and delivery outcome.
Results: During the study period 99 women underwent planned VBAC. Among these women 35% were Caucasian, 28% were Afro-Caribbean and 32% were Asian. In 85% women who had spontaneous onset of labour, 48% achieved vaginal delivery and only 25% of women achieved vaginal delivery after induction of labour. There was very poor documented discussion of risk and benefits during the antenatal period and the majority of women were counselled by middle-grade doctors and consultants. There were five special care baby unit admissions.
Conclusions: We recommended that there should be a special VBAC clinic in the unit to manage these women as per the set standards.

PLD.67 ESCAPE FROM DEATH, A CLOSE ENCOUNTER: A CASE REPORT

K Kamakshi, M Moloney. *Good Hope Hospital, Birmingham, UK*

A 31-year-old gravida 2 para 0 had an uneventful antenatal period till 37 weeks. She was induced because of pre-ecclampsia. She had an emergency Caesarean section under general anaesthetic as a result of a pathological cardiotocograph. The baby was delivered in good condition. While the abdomen was being closed, the anaesthetist called for the cardiac arrest team. Her central pulses were not felt. She had asystole followed by ventricular fibrillation.

She reverted to normal rhythm after 20 minutes of cardiopulmonary resuscitation, three DC shocks and eight doses of adrenaline. She was then stabilised and transferred to the intensive care unit and very soon she went into disseminated intravascular coagulation. Her clotting was corrected and she went into renal failure, which was corrected. A week later she had tracheostomy and after another week was on continuous positive-airways pressure. After 3 weeks, she was moved to the postnatal ward and went home a week later without any sequelae.

The possible diagnosis with such a cascade of events is most likely to be amniotic fluid embolism. Acute hypotension or cardiac arrest, acute hypoxia, coagulopathy, absence of any other explanations and events occuring during labour, Caesarean or within 30 minutes postpartum are strongly suggestive of amniotic fluid embolism. Most of the investigations are non-specific. It is associated with very high mortality and morbidity. This is a rare case with an extremely good outcome after an acute catastrophic event. High clinical suspicion, early and timely resuscitation with excellent teamwork definitely contributed to giving the best outcome.

BMFMS: Maternal Medicine

PMM.01 DIFFERENCES IN PLACENTAL GLUTATHIONE PEROXIDASE ACTIVITIES AND MRNA EXPRESSION BETWEEN NORMAL AND PRE-ECLAMPTIC PREGNANCIES

H Mistry, MM Ramsay, F Broughton Pipkin, ME Symonds. *CREL/Divisions of Child Health/Obstetrics and Gynaecology, University of Nottingham, Nottingham, UK*

Background: Pre-eclampsia is associated with impaired placentation, oxidative stress and systemic endothelial damage. Glutathione peroxidases (GPx1, 3 and 4) are selenoproteins and play critical roles in regulating antioxidant status; they reduce damaging hydrogen peroxide products, preventing the propagation of reactive oxygen species thereby protecting the endothelial lining of placental spiral arteries. We know of no systematic study of placental GPx in pre-eclampsia.

Objectives: To measure mRNA expression and activity of placental GPx in Caucasian women with pre-eclampsia (PE) and matched normotensive controls (NC).
Design: Hospital-based cross-sectional study, approved by LREC; informed, written consent was obtained from all subjects. PE: resting blood pressure of ⩾140/90 mm Hg in a previously normotensive woman, with significant new, sustained proteinuria after 20 weeks' gestation. Placentae were taken from 27 NC and 23 PE women. The mRNA expression levels of the three GPx (real-time PCR) and total GPx activities (spectrophotometric assay) were measured.
Results: Placental mRNA expression levels of all three GPx were not significantly different in PE compared with NC ($p>0.05$). However, total GPx enzyme activities (mean ± SD) were significantly reduced ($p<0.05$) in placentae from PE (0.1 ± 0.1 nmol/l) compared with NC (0.4 ± 0.3 nmol/l); no differences were found between placental sampling sites.
Conclusions: Oxidative stress associated with pre-eclampsia may be a consequence of reduced antioxidant defence specifically involving GPx. Our results indicate that a post-translational alteration leads to reduced GPx activities and that this may be important in the pathophysiology of pre-eclampsia.

PMM.02 VITAMIN D DEFICIENCY AND SUPPLEMENTATION IN PREGNANT WOMEN OF FOUR ETHNIC GROUPS

[2]C Yu, [2]L Newton, [1]S Robinson, [2]TG Teoh, [1]M Sethi. *[1]Imperial College, London, UK; [2]St Mary's Hospital, London, UK*

Objective: To determine the vitamin D status in pregnancy and to evaluate the effects of daily versus single-dose vitamin D supplementation in four ethnic groups.
Design: A randomised study in a London antenatal clinic.
Participants: 180 pregnant women: 45 Indian Asians, 45 middle eastern, 45 black and 45 Caucasian.
Intervention: Randomisation into three groups: a single oral dose of 200 000 IU vitamin D, a daily supplement of 800 IU vitamin D from 27 weeks and a no treatment group.
Results: At 27 weeks' gestation, there was a significantly lower vitamin D level in Asian (25 ± 9.8 nmol/l), middle eastern (21 ± 9.3 nmol/l) and black women (23 ± 13.1 nmol/l) compared with Caucasian women (42 ± 16.6 nmol/l); $p<0.001$. Secondary hyperparathyroidism (n = 46) was significantly higher in Asian (26.7%), middle eastern (48.9%) and black women (24.4%) compared with Caucasian women (2.2%); $p<0.05$. Calcium levels were normal in all women at 27 weeks and at delivery. Predictors of vitamin D levels were ethnicity, age, parity and sunlight exposure. There was a significant increase in the maternal vitamin D in the supplemented group (daily dose 42 ± 24 nmol/l, stat dose 34 ± 15 nmol/l versus 27 ± 19 nmol/l in the no treatment group; $p<0.0001$), with no significant difference in the method of supplementation. Cord vitamin D was significantly increased after supplementation (daily dose 27 ± 16 nmol/l, stat dose 25 ± 10 nmol/l versus 17 ± 11 nmol/l in the no treatment group; $p = 0.001$).
Conclusions: Pregnant women may benefit from vitamin D supplementation in pregnancy, which can be achieved with a single dose at 27 weeks' gestation.

PMM.03 THE INFLUENCE OF PREGNANCY ON COGNITIVE ABILITY

[2]D Farrar, [1]J Neill, [1]KM Marshall, [2]DJ Tuffnell. *[1]University of Bradford, Bradford, UK; [2]Bradford Institute for Health Research, Bradford, UK*

Background: Studies suggest sex steroids influence learning and memory strategies. Data from human trials involving various hormone replacement regimens and assessment of memory in pregnancy appear equivocal. Pregnancy allows elevation of endogenous ovarian steroid levels, depending on concentration oestrogen can be neurologically protective or toxic. This investigation aims to increase the understanding of steroid effects on memory and attention during pregnancy.
Methods: Participants (n = 40) were tested preconceptually, each trimester and postnatally. A control group was tested using the same methodology. The Cambridge Neuropsychological Test Automated Battery, an objective computer-based psychometric assessment, was utilised to examine specific cognitive domains. Demographic, mood and general health data were collected at each session along with plasma for later analysis of hormone levels.
Results: Data indicate first and second trimester deficit in certain cognitive tasks. Group numbers at present are insufficient to provide meaningful third trimester examination. Analysis indicates groups are comparable in age, intelligence and general wellbeing (see table).
Discussion: Initial data support the hypothesis that pregnancy adversely affects performance of certain cognitive tasks, in particular short-term working memory; the significant finding in terms of probability error may indicate increased emotionality or a memory processing deficit.

Abstract PMM.03

Psychometric assessment	Control group	Pregnant group
Delayed matching to sample (working memory, first trimester)	86.66 (SD 7.5)	79.23 (SD 8.5) (p = 0.006)
Delayed matching to sample probability error (emotional response, first trimester)	0.06 (SD 0.10)	0.16 (SD 0.11) (p = 0.008)
Spatial recognition memory (working memory, second trimester)	83.75 (SD 8.4)	73.33 (SD 13.7) (p = 0.02)

PMM.04 WITHDRAWN

PMM.05 UTERINE MALFORMATIONS MAY BE ASSOCIATED WITH ABNORMALITIES IN THE HEPATOCYTE NUCLEAR FACTOR 1B GENE

J Blackman, E Edghill, S Ellard, MJO Taylor, C Bingham. *Royal Devon and Exeter NHS Trust, Exeter, UK*

Introduction: Congenital genital tract malformations in women have a prevalence of 0.5–4.3%. During embryological development in the female the two Müllerian ducts fuse to form the vaginal tract and uterus. Incomplete fusion leads to numerous anomalies of the genital system. Renal tract malformations are sometimes associated with uterine malformations. Hepatocyte nuclear factor 1β (*HNF1β*) is a widely distributed transcription factor that plays a critical role in the development of the kidney, Müllerian duct, pancreas and liver. Heterozygous mutations and whole or partial gene deletions of the *HNF1β* gene are associated with renal disease, typically renal cysts, uterine malformations, diabetes, abnormal liver function tests and hyperuricaemia.
Aim: We aimed to identify women with Müllerian tract malformations and screen them for abnormalities in the *HNF1β* gene.
Methods: A total of 23 women were recruited from the early pregnancy assessment unit, or at the time of Caesarean section or gynaecological surgery. The *HNF1β* gene was screened for mutations using direct sequencing and a multiplex ligation-dependent probe amplification assay to detect whole and partial gene deletions.
Results: One patient with a bicornuate uterus had a heterozygous whole *HNF1β* gene deletion (Met1_Trp557del). On subsequent investigation this patient was found to have cystic kidneys and abnormal liver function tests. Tests of renal function, blood glucose and urate were normal.

Conclusions: Uterine malformations may be associated with abnormalities in the *HNF1β* gene. The *HNF1β* phenotype is associated with multisystem disease but patients may present initially to obstetricians.

PMM.06 WITHDRAWN

PMM.07 WITHDRAWN

PMM.08 A PROSPECTIVE STUDY OF MATERNAL ENDOTHELIAL FUNCTION, ANGIOGENIC FACTORS AND PLACENTAL PERFUSION IN WOMEN WHO DEVELOP FUTURE PRE-ECLAMPSIA

[1]M Noori, [2]A Donald, [3]M Savvidou, [4]A Hingorani, [5]D Williams. *[1]Imperial College, London, UK; [2]Institute of Child Health, University College London, London, UK; [3]Harris Birthright Research Centre, Kings College Hospital, London, UK; [4]Centre for Clinical Pharmacology, British Heart Foundation Laboratories, University College London, London, UK; [5]Institute of Women's Health and Elizabeth Garrett Anderson Hospital, University College London, London, UK*

Introduction: It has been postulated from cross-sectional studies that inhibitors of angiogenesis induce maternal endothelial dysfunction that leads to pre-eclampsia. We tested this hypothesis in a prospective study.
Methods: 163 women were followed from early pregnancy (12 weeks) until 3 months postpartum. Twenty-four of these women developed pre-eclampsia. Endothelial function (flow-mediated dilatation), mean arterial pressure (MAP) and levels of placental growth factor (PlGF), soluble vascular endothelial growth factor receptor-1 (sFlt-1), soluble endoglin (sEng) and the sFlt-1 : PlGF ratio were measured prospectively through pregnancy. At 24 weeks' gestation, uteroplacental blood flow (pulsatility index; PI) was assessed using Doppler ultrasound.
Results: From the first trimester, women who developed pre-eclampsia, particularly before 34 weeks, had a higher MAP ($p<0.0005$), endoglin ($p = 0.002$), sFlt-1 : PlGF ratio ($p<0.0005$) and suppressed levels of PlGF ($p = 0.001$) compared with those who did not develop pre-eclampsia. Women who developed pre-eclampsia also had the highest uteroplacental PI at 24 weeks' gestation compared with women who did not develop pre-eclampsia ($p = 0.0008$). Brachial artery FMD was not significantly different among the two groups as pregnancy advanced. At 24 weeks' gestation, levels of pro and anti-angiogenic factors correlated with MAP and PI.
Conclusions: We have prospectively demonstrated alterations in serum PlGF, sFlt-1 and endoglin from early pregnancy in women who went on to develop pre-eclampsia. Levels of soluble factors correlated with MAP and PI at 24 weeks suggesting possible causality. Measurement of pro and anti-angiogenic factors in conjunction with MAP and PI hold promise as a tool for evaluating the risk of developing pre-eclampsia.

PMM.09 EFFECT OF ANTIHYPERTENSIVE TREATMENT ON ANGIOGENIC FACTORS IN WOMEN WITH HYPERTENSIVE DISORDERS IN PREGNANCY

[1]A Khalil, [2]S Muttukrishna, [1]K Harrington, [2]E Jauniaux. *[1]Queen Mary, University of London, London, UK; [2]University College London, London, UK*

Angiogenic factors play an important role in the pathophysiology of pre-eclampsia. It has recently been shown that antihypertensive drugs can alter cytokine release in normal and hypertensive pregnancy. These cytokines are known to stimulate secretion of both soluble fms-like tyrosine kinase 1 (sFlt-1) and vascular endothelial growth factor. It is not known if antihypertensive therapy can affect the secretion of angiogenic factors in pre-eclampsia.

We recruited 63 women with pre-eclampsia, 66 with non-proteinuric hypertension and 129 matched normotensive controls. Placental growth factor (PlGF), sFlt-1 and soluble endoglin (sEng) levels, before and 24–48 h after initiating antihypertensives, were measured using an ELISA. Having validated these assays for placenta, the same markers were measured in 84 placentas delivered at Caesarean section (29 pre-eclampsia, 24 hypertension and 31 controls).

The three study groups were compared using ANOVA multiple comparisons. Data were normally distributed after logarithmic transformation. Marker levels before and after antihypertensive therapy were compared using a paired t-test.

In both pre-eclampsia and hypertension, serum sFlt-1 was increased, and PlGF reduced at all gestations ($p<0.0001$). sEng levels were also increased in pre-eclampsia. After 28 weeks, antihypertensive treatment was associated with a significant fall in serum sFlt-1 and sEng in pre-eclampsia only. The concentrations of both sFlt-1 and sEng were significantly higher in the placentas of women with pre-eclampsia, but not hypertension, compared with controls ($p = 0.0002$). Only sFlt-1 was significantly reduced in the placenta in treated women.

Antihypertensive drugs may have an effect on the pathophysiology of pre-eclampsia other than their known antihypertensive action.

PMM.10 PRE-ECLAMPSIA IN THE SECOND PREGNANCY: DOES PREVIOUS OUTCOME MATTER?

[1]S Bhattacharya, [1]DM Campbell, [2]N Smith. *[1]University of Aberdeen, Aberdeen, UK; [2]Grampian University Hospitals Trust, Aberdeen, UK*

Background: Although previous term live birth has been unequivocally shown to be protective, opinion is divided as to the effect of a previous abortive outcome on the risk of pre-eclampsia.
Objective: To assess the effect of initial pregnancy outcome and gestational age on the risk of pre-eclampsia in the second pregnancy.
Methods: We conducted a case–control study using data from the Aberdeen Maternity and Neonatal Databank between 1986 and 2006. Cases were women who had pre-eclampsia and controls were normotensive in their second pregnancy. Crude and adjusted odds ratios (OR) were produced for each of the risk factors using logistic regression.
Results: Inter-pregnancy intervals of 6 years or more were associated with increased incidence of pre-eclampsia (19.4% versus 14.7%). A change of partner had a protective effect whereas an increase in BMI increased the risk of pre-eclampsia. A history of pre-eclampsia was associated with a five times higher risk (adjusted OR 5.12, 95% CI 4.42 to 6.48) of pre-eclampsia in the second pregnancy. Compared with a term delivery, a previous second trimester abortion was associated with a four times higher risk of pre-eclampsia in the next pregnancy. Previous very preterm and preterm births were associated with adjusted OR of 2.32 (95% CI 1.62 to 3.32) and 1.62 (95% CI 1.46 to 1.72), respectively. The risk of pre-eclampsia was no higher in women with a previous history of stillbirth or late miscarriage than those with a previous live birth.
Conclusions: Only deliveries beyond 37 weeks, irrespective of outcome, were protective against pre-eclampsia in the second pregnancy.

PMM.11 THE USE OF SPOT URINE PROTEIN : CREATININE RATIO IN THE DIAGNOSIS OF PRE-ECLAMPSIA

L Newton, C Biswas. *St Mary's NHS Trust, London, UK*

Aim: The aim of this retrospective observational study was to compare the accuracy of the spot urine protein : creatinine ratio with the gold standard of a 24-h urine collection in the diagnosis of pre-eclampsia in 66 paired samples.

Results: Using uPCR cut-off value of 30 as "positive", 22.2% (2/9) women with <0.3 g/24 h of protein had a false positive result. In women with mild proteinuria (between 0.3 g and 1 g/24 h; n = 12) there were no false positives or false negatives; in these women, the value of (uPCR × 10) approximated the amount of protein in the urine over 24 h. In women with >1 g/24 h of proteinuria, four of nine uPCR samples underestimated the amount of protein in the urine; however, there were no negative uPCR. Similarly in women with >3 g/24 h of proteinuria two of three samples underestimated the amount of proteinuria, but again there were no negative uPCR. In summary, the sensitivity of urine protein : creatinine ratios was found to be 100% (24/24) with a positive predictive value of 92% (24/26). The specificity was 77% (7/9) and the negative predictive value was 100% (7/7).
Conclusions: Spot urine protein : creatinine ratio can be used as a quick, convenient and effective method of screening to assist with the diagnosis of pre-eclampsia. However, we found that it underestimated the amount of protein in women with >1 g urine protein/24 h, thus a 24-h urine collection may still be indicated in women with pre-eclampsia.

PMM.12 MATERNAL VITAMIN D STATUS IN DIABETIC PREGNANCY

L Campbell, C Sismanidis, T Edwards, P Timms, KJ Erskine. *Homerton University Hospital, London, UK*

Background: Diabetes, as a result of changes in disease definition, is becoming more common in women of child bearing age and diabetic pregnancies are known to be high risk. Pregnancy is associated with low serum levels of vitamin D. We wished to determine whether low levels of vitamin D predispose to diabetes in pregnancy.
Methods: Two cohorts of women, 154 non-diabetic and 89 diabetic (type 1, type 2 and gestational) were followed up during pregnancy for 13 months. Serial vitamin D blood samples and measures of glycaemic control were taken at first antenatal visit, 26 weeks' and 34 weeks' gestation in non-diabetic women, and in diabetic women samples were taken at first visit and at monthly intervals thereafter. Ethnicity, age and diabetes type of women and birthweight of babies were recorded.
Findings: Vitamin D during pregnancy changed in a quadratic relationship with gestation. Individually, diabetes, ethnicity and haemoglobin A1c were significantly associated with a change in vitamin D ($p<0.01$), with decreased vitamin D levels for diabetic women, Asian and black women and with increased haemoglobin A1c. In multivariate analyses, only ethnicity remained an important risk factor for change in vitamin D levels. Asian women had moderate to severely deficient vitamin D levels throughout pregnancy and black women mildly deficient levels throughout pregnancy.
Conclusions: Maternal diabetes in pregnancy is associated with an increased likelihood of vitamin D deficiency. Further work is needed to determine whether low vitamin D levels are associated with a predisposition for diabetes.

PMM.13 PHYSICAL ACTIVITY MEASUREMENT IN OVERWEIGHT AND OBESE PREGNANT WOMEN

[1]C McParlin, [2]R Bell, [3]TI Kinnunen, [2]AJ Adamson, [2]MS Pearce, [2]J Rankin, [2]SC Robson. *[1]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; [2]Newcastle University, Newcastle upon Tyne, UK; [3]The UKK Institute for Health Promotion Research, Tampere, Finland*

Background: Increased maternal physical activity levels during pregnancy may reduce the risk of gestational diabetes, pre-eclampsia and other obesity-related pregnancy complications. Data on activity levels in pregnancy are sparse. This study assessed physical activity in overweight pregnant women via self-completed questionnaire and objectively via an accelerometer.
Methods: 36 pregnant women (26% of eligible women) with BMI ⩾25 kg/m^2 completed objective physical activity assessment for 6.1 days on average alongside the Australian Women's Activity Survey (AWAS) at 11–15 weeks' gestation. Outcome measures were time spent in different activity intensity categories (minutes/day) and percentage of women accumulating at least 30 minutes/day at moderate or vigorous physical activity (MVPA).
Results: The median (interquartile range) BMI was 28.4 kg/m^2 (26.6–32.3) and 56% were primiparous. Objectively measured mean (SD) time spent in light and MVPA was 128 (39) and 41 (18) minutes/day and 69% of women accumulated at least 30 minutes/day of MVPA on average. Parous women had more light intensity activity compared with nulliparous women, but there was no significant difference in average MVPA between parity groups. A higher proportion of nulliparous women accumulated at least 30 minutes/day of MVPA compared with parous women. Overweight and obese women had similar activity levels. Self-reported activity levels were higher than those assessed by accelerometry.
Conclusions: Activity patterns in overweight and obese pregnant women differ by parity. Two-thirds of this group achieved recommended levels of MVPA, although possible participation bias may affect generalisability. Evaluation of interventions to increase physical activity in pregnancy should ideally use objective measurement methods.

PMM.14 OBESITY IN PREGNANCY: A SERIOUS CONCERN

N Aslam, C Flether, P Abedeen, S Houghton. *Good Hope Hospital NHS Trust, Birmingham, UK*

Background: Maternal obesity is a serious and growing health problem worldwide. The recent CEMACH report "Saving mothers' lives" clearly highlighted that more than half of all the women who died were either overweight or obese.
Aims/Objectives: To benchmark existing practice and to assess the extent of the problem due to obesity in pregnancy, labour and postpartum. Recommending measures to formulate unit guidelines and improve patient care.
Materials and Methods: Retrospective analysis in 2006. Random selection of 50 women with BMI >35. Demographics, pregnancy and labour outcome were collected by reviewing case notes.
Results: 4% had BMI >35. The majority were Caucasian (90%). Anomaly ultrasound performed were documented as much more difficult in obese patients, with 27% requiring more than two scans as well as multiple growth scans in 34%. These patients were 2.5 times more likely to be diagnosed with hypertension, 16% of patients were diagnosed with gestational diabetes and 12% with fetal macrosomia. Obese women had a higher rate of induction of labour (42%) compared with controls (20.26%) and a higher rate of failed induction 28%. Caesarean section rates including both emergency and elective were higher: 25% versus 14% and 18% versus 12% in the control group. The incidence of fetal distress with suboptimal cardiotocograph was 14% and shoulder dystocia was 11%. Standard doses of antibiotics and thromboprophylaxis were used irrespective of BMI.
Conclusions: Guidelines are urgently required for the management of obese pregnant women. Prepregnancy counselling and weight loss together with wider public health messages about optimum weight should help to reduce the number of obese women who become pregnant.

PMM.15 ARE WE OVERTREATING SUSPECTED URINARY TRACT INFECTION IN PREGNANCY?

P Akhter, A Misbah, A Hassan, R Green. *Cork University Maternity Hospital, Cork, Ireland*

Introduction: Increasing antibiotic resistance is a worldwide concern. It constitutes a major public health threat. The current

trend is to treat pregnant women presenting with symptoms of urinary tract infection (UTI) with a short course of antibiotics, which may result in antibiotic resistance.
Aims and Objective: To determine the practice of prescribing antibiotics among Irish obstetricians in suspected UTI.
Patients and Methods: A prospective audit in Unified Maternity Hospitals Cork, October 2006–January 2007 was performed.
Results: 150 women presented with symptoms of UTI and 110 (73.3%) received antibiotics at the initial visit. Patient demographics showed a mean age of 28 years, mean gestation 26 weeks, 52 (34.66%) women had previous UTI and 47 (31.3%) were smokers. Mid-stream urine (MSU) was positive in only 28 (18.66%) cases, 62 (41.3%) had negative results and 60 (40%) mixed growth. 44/60 (73.33%) received antibiotics even in the mixed group. Among 28 women with a positive MSU result, on dipstick urine analysis (UA) 22 (78.6%) were positive for leucocytes, 14 (50%) had protein and eight (28.6%) had nitrate. A similar result on UA was also noted in women with a negative MSU, high leucocytes 38/62 (61.3%) and high 22/62 (33.5%) protein. However, all women in the MSU-negative group also had nitrate negativity.
Discussion and Conclusion: The prevalence of UTI was 18.66%. There was a tendency among obstetricians to overtreat these women. Bedside UA appeared to be a poor predictor for UTI. Nitrate negativity may be a useful negative predictor. We strongly suggest to wait for the MSU result before prescribing antibiotics.

PMM.16 PLASMA SFLT-1 AND SOLUBLE ENDOGLIN LEVELS IN LABOUR AND DELIVERY: NORMAL PREGNANCY AND PRE-ECLAMPSIA COMPARED

[1]A Reddy, [2]S Suri, [3]IL Sargent, [3]CWG Redman, [2]S Muttukrishna. *[1]University College London Hospital, London, UK; [2]University College London, London, UK; [3]Nuffield Department of Obstetrics and Gynaecology, Oxford, UK*

Background: High levels of circulating placental anti-angiogenic factors such as soluble fms-like tyrosine kinase-1 (sFlt-1) and endoglin (sEng) precede the onset of pre-eclampsia. They impair endothelial function and may thereby cause the maternal syndrome. We tested the hypothesis that the events of labour/delivery may increase plasma levels of sFlt-1 and sEng.
Methods: To assess the effects of placental delivery, plasma samples were taken from 10 normal pregnant (NP) and 10 pre-eclamptic (PE) women undergoing elective Caesarean section pre-delivery, placental delivery and 10 minutes, 60 minutes and 24 h afterwards. To assess the effects of labour, samples were taken from 10 NP and 10 PE women pre-labour, at full dilation, placental delivery and 24 h. sFlt-1 and sEng were measured using commercial ELISA.
Results: The levels of sFlt-1 and sEng were significantly higher in PE compared with NP women in both groups. During Caesarean section, the levels of sFlt-1 in the peripheral plasma of both NP and PE women decreased with the delivery of the placenta and declined significantly by 24 h. In contrast, in labour, sFLT levels increased significantly at full dilatation in both NP and PE women (much more in PE, $p<0.001$), before declining by 24 h. Plasma sEng levels also declined rapidly with placental delivery at Caesarean section in NP and PE pregnancies, but there was no significant rise in sEng levels during labour in PE.
Conclusions: Labour increases the levels of sFlt but not sEng in NP and PE groups. An increase in sFlt release in labour could contribute to the postpartum worsening of pre-eclampsia in some cases.

PMM.17 PREGNANCY OUTCOMES IN TREATED GESTATIONAL DIABETES IN A MIXED ETHNIC POPULATION

[1]R Gosakan, [1]P Ray, [1]D Whitelaw, [2]A Scally, [1]DJ Tuffnell. *[1]Bradford Royal Infirmary, Bradford, UK; [2]Bradford University, Bradford, UK*

Objective: To examine the influence of ethnicity on women treated with gestational diabetes.
Setting: Teaching hospital with a multiethnic population.
Methodology: Retrospective case review: February 1994–October 2007. Data analysis using univariate and mutivariate logistic regression.
Outcome Measures: Perinatal loss, Caesarean section rate, birthweight >4 kg, shoulder dystocia.
Results: Of the 1019 women, 714 (70%) were Asians (G1), 276 (27%) were white (G2) and 29 (3%) were black (G3). 404 of the G1 (57%), 130 of the G2 (47%) and 18 of the G3 (62%) needed insulin in addition to dietetic advice and exercise. Compared with G2, G1 and G3 were more likely to need insulin treatment ($p = 0.02$). Increasing age increased the need for insulin ($p = 0.01$). The insulin-treated group had a higher Caesarean section rate in all the ethnic groups, 163/467 on diet, 255/552 on insulin ($p<0.001$). There were 24 perinatal deaths in total not related to ethnicity ($p = 0.08$) or treatment modality ($p = 0.31$). Shoulder dystocia in the group over 4 kg was 10%, compared with 1% in the under 4 kg group. This was the only significant predictor of shoulder dystocia ($p<0.001$). Ethnicity and treatment did not influence macrosomia rates, and logistic regression analysis demonstrated that maternal weight ($p<0.001$) was the single most important predictor of this outcome.
Conclusions: Asians were more likely to need insulin treatment. Ethnicity did not have an effect on the perinatal loss, Caesarean section rate, birthweight over 4 kg or risk of shoulder dystocia.

PMM.18 PROGESTERONE FOR PREVENTION OF PRETERM BIRTH AND IMPROVEMENT IN PREGNANCY OUTCOMES AMONG PRIMIPARAE OF ADVANCED MATERNAL AGE

P Moghtadaei, F Sardari, M Latifi. *Parastarane-Shahed Hospital, Iran University of Medical Sciences, Tehran, Iran*

Objective: In many articles, 17 alpha-hydroxyprogestrone caproate (17p) has been shown to reduce the rate of recurrent preterm labour and also in women with short cervix or twin pregnancy. This study was undertaken to evaluate whether 17p would reduce the rate of preterm birth in advanced maternal age.
Methods: A randomised, double-blind, placebo-controlled trial in primiparous women aged 35 years or more was performed. Patients were assigned to weekly intramuscular injections of 250 mg 17p or matching placebo, starting at 16–20 weeks of gestation and ending at 34 weeks. The primary and secondary outcomes were assessed.
Results: 260 women were randomly assigned to treatment. Delivery before 37 weeks occurred in 27.2% of pregnancies in the 17p group and 36.5% of patients in the placebo group (relative risk (RR) 0.6, 95% CI) and also delivery before 35 weeks was 10.6%, versus 20.7%, RR 0.67 (95% CI) and delivery before 32 weeks was 6.4% versus 12.2%, RR 0.58 (95% CI). The secondary outcome in infant and other pregnancy outcomes such as hypertension, diabetes, intrauterine growth restriction in the 17p group were less than in the placebo group. Side effects at the injection site in both groups occurred in 61% and 58.2% of subjects, respectively ($p = 0.633$), but were mild and limited to the injection sites.
Conclusions: Treatment with 17p can reduce the rate of preterm birth in primiparous advanced aged women.

PMM.19 ASSESSMENT OF CERVICAL WEAKNESS IN WOMEN WITH A HISTORY OF MID-TRIMESTER LOSSES

TW Kundodyiwa, R Farquharson, F Dawood, M Whitworth, S Quenby. *Liverpool Women's NHS Foundation Trust, Liverpool, UK*

Background: Cervical weakness is an important cause of mid-trimester losses. The diagnosis is challenging as there is no definitive diagnostic test and the optimal test of assessment remains unknown. As an adjunct to a carefully elicited history, the Hegar resistance test and transvaginal ultrasonography (TVS) of the cervix are methods known to assess cervical weakness. The aim of this

study was to compare these two methods in the assessment of cervical weakness.
Methodology: A prospective observational study of 32 women with a history of mid-trimester losses suggestive of cervical weakness. All underwent a preconceptual cervical assessment using graduated Hegar dilators (easy passage of ⩾9 mm Hegar dilators representing cervical weakness) and then subsequent serial TVS measuring cervical length during pregnancy.
Results: Fifteen of the 18 women with abnormal preconceptual Hegar tests had a normal serial TVS in pregnancy and three had significant asymptomatic funnelling and shortening (<15 mm) of the cervix before 28 weeks' gestation detected by serial TVS. Three of the 14 women with a normal Hegar test had significant asymptomatic funnelling and shortening of the cervix before 28 weeks' gestation detected by serial TVS.
Conclusions: The Hegar resistance test yielded different results to serial TVS in pregnancy. We suggest that the Hegar test is predictive of structural weakness, whereas serial TVS is predictive of functional weakness of the cervix in response to pregnancy. Both methods remain important tools in the investigative protocol of mid-trimester losses.

PMM.20 IS ANTENATAL STRESS, ANXIETY AND DEPRESSION ASSOCIATED WITH PRETERM BIRTH? A SYSTEMATIC REVIEW

L Wood, G Lancaster, S Quenby. *Liverpool University, Liverpool, UK*

Stress, anxiety and depression have been suggested as causative factors in preterm birth in some studies but not others. We conducted a systematic review of the literature using all relevant electronic databases for studies describing stress, depression, preterm birth and immune response during pregnancy.

372 papers were identified electronically with 36 meeting the criteria for the review. 12 papers were identified through reference lists and journal hand-searching. Of these 48 papers, 18 were included with a total of 110 304 women and 30 excluded.

There were considerable differences in the measurement techniques used to assess stress, anxiety or depression; hence a meta-synthesis was performed using Bradford–Hill criteria as a conceptual model to determine causality.
Results: The strength of association was low and inconsistent in low-risk women (13 studies). All five studies that assessed high-risk women found a moderately positive association between stress and preterm birth. Women with more life events were more likely to deliver preterm, indicating a dose–response effect. Biological plausibility was found, as stress increased cortisol releasing hormone, which in turn is associated with preterm labour. Temporality was confirmed as only studies with stress before labour were included. However, stress, anxiety or depression, were not specific causes of preterm labour.
Conclusions: The systematic meta-synthesis using Bradford–Hill criteria found that stress, anxiety and depression were contributors to preterm labour in women with other risk factors.

PMM.21 THE INCREASING INCIDENCE OF TYPE 2 DIABETES IN PREGNANCY IN NORTH-EAST ENGLAND

T Coulthard, G Hawthorne. *Newcastle Diabetes Centre, Newcastle upon Tyne, UK*

Objective: Type 2 diabetes, a risk factor for complications in pregnancy, is increasing in incidence. We audited whether pregestational type 2 diabetes in pregnancy is increasing in the former UK northern health region.
Research Design and Methods: We obtained 11 years of prospective data from the Northern Diabetes Pregnancy Survey and analyzed its association with age, BMI and ethnicity and the perinatal mortality and stillbirth rates.
Results: We found a dramatic, nearly fourfold increase in type 2 diabetes in pregnancy ($r^2 = 0.85$) within 11 years. The majority of the women were white (80.8%), although ethnic minorities were overrepresented. Most women were overweight or obese (88.2%) and older at delivery than the general population (median age 34 years). Stillbirth and perinatal mortality rates were four to five times higher than the national average.
Conclusions: The number of pregnancies with type 2 diabetes is increasing sharply, with important implications for service provision.

PMM.22 PREGNANT SUBSTANCE MISUSERS: SHOULD WE ROUTINELY ENQUIRE ABOUT THE PARTNER'S DRUG MISUSE AND FORENSIC HISTORY?

[2]P Moran, [1]K Bristow, [3]F Ibrahim, [1]E Kaner, [1]J Rankin, [3]E Gilvarry. *[1]Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK; [2]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; [3]Northumberland Tyne and Wear NHS Trust, Newcastle upon Tyne, UK*

Introduction: Among pregnant substance misusers a complex network of potentially deleterious psychosocial factors exists. It is essential to establish the role of the partner as the family environment is crucial to the maintenance of health during pregnancy and subsequently to successful parenting.
Aim: To identify any correlation between drug misuse and forensic history in pregnant substance misusers and their partners.
Methods: A retrospective cohort of women and partners attending a specialist addictions antenatal clinic between November 2005 and February 2006.
Results: 68 women were referred during the time period. 59 were known to have a partner and drug history was known for 49 (83%). 76% of partners had a history of use: opiates 21 (60%), cannabis 11 (31%) and alcohol three (9%). 41% had polydrug use. 18 of the 21 primary opiate users were on opiate replacement therapy. Misuse of the same primary substance was most common among opiate misusers (85%) and cannabis users (100%) but was also frequent in alcohol misusers (60%). Forensic history rates were similar in mothers (29%) and partners (31%) and a significant association was shown between the two (Fisher's exact test $p = 0.012$).
Conclusions: There is a correlation between maternal and partner substance misuse and forensic histories within this patient group. It is recommended that partner's drug misuse and forensic histories are always sought. Successful management of substance misuse during pregnancy is unlikely to be effective without close consideration of the partner's role and treatment needs. A holistic approach to antenatal care is required for this high-risk group.

PMM.23 ALTERNATIVE VILLOUS BRANCHING INDICES ASSESSED USING PLACENTAS FROM PREGNANCIES COMPLICATED BY PRE-ECLAMPSIA AND INTRAUTERINE GROWTH RESTRICTION

JA López Bernal, TM Mayhew. *University of Nottingham, Nottingham, UK*

Patterns of fetoplacental angiogenesis (branching versus non-branching) vary during gestation and in several pregnancy complications. The pattern of angiogenesis also influences the development and branching of placental villi. The amount of villous branching relates to the number of trophoblast bridges seen on placental sections. The aim of this study was to assess the precision of two new stereological methods that quantify villous branching patterns based on trophoblast bridges. If sufficiently precise, such methods might prove useful for assessing the effects of pre-eclampsia and intrauterine growth restriction (IUGR) on villous branching.

Term placentas from four study groups: control pregnancies (n = 9), pre-eclampsia alone (n = 5), IUGR alone (n = 5) and pre-eclampsia with IUGR (n = 5) were randomly sampled and

stained using the Masson trichrome method. They were analyzed blind using two separate morphometric techniques providing two branching indices. The first index used unbiased counting frames to provide two-dimensional estimates of the number of trophoblast bridges per villous profile. The second used random test line probes to give three-dimensional estimates of the fractional villous surface area occupied by trophoblast bridge sites. The precision of each branching index was expressed as a coefficient of error.

The estimation precisions of both methods were low. Therefore, it is concluded that neither method would be useful for quantifying villous branching patterns in the placenta in pre-eclampsia or IUGR. Quantitative studies, using techniques that allow vasculature to be studied directly in three dimensions, are likely to be more valuable in analysing the true effects of pre-eclampsia and IUGR on fetoplacental angiogenesis.

PMM.24 ORAL HEALTH-RELATED QUALITY OF LIFE IN PREGNANCY

[2]MK Whitworth, [1]R Harris. *[1]University of Liverpool, Liverpool, UK; [2]Liverpool Women's NHS Foundation Trust, Liverpool, UK*

The link between poor oral health and cardiovascular disease is well established and many studies have indicated that periodontal disease is linked to poor obstetric outcomes such as preterm birth. A significant association exists between oral health-related quality of life (OHRQoL), as assessed by the OHIP-14 questionnaire, and periodontal disease. Standardised OHIP-14 scores are available for the UK population. Our aim was to look at the OHRQoL of a pregnant population and assess whether this differs from UK norms.

Women delivering at Liverpool Women's Hospital were asked to complete the OHIP-14 questionnaire between 36 weeks' gestation and 14 days postnatal. Data were analyzed using SPSS 13.0. The OHIP-17 questionnaire contains 14 items, scored 0–4. A maximum score of 56 is possible. Higher scores correspond to poorer OHRQoL.

1079 completed questionnaires were analyzed (October 2005–June 2007). The mean age of the population was 29.9 years (range 15–50). Pregnant women in Liverpool have significantly higher OHIP-14 scores (poorer OHRQoL) than non-pregnant women in the United Kingdom.

51% of the cohort was drawn from the most deprived decile of England, as determined by indices of multiple deprivation. These women have significantly poorer OHRQoL and are less likely to have visited a dentist during pregnancy than the least deprived women ($p<0.05$). Links to poor obstetric outcome require further investigation.

Abstract PMM.24

Age (years)	Liverpool	UK Norm	p Value
<18	9.3 (7.6)	Not available	
18–24	8.8 (9.9)	5.2 (7.6)	<0.001
25–34	8.2 (8.9)	5.3 (6.2)	<0.001
35–44	7.8 (8.6)	5.9 (7.0)	<0.001

PMM.25 PERINATAL CONSEQUENCES OF FETAL MACROSOMIA ARE DIFFERENT IN PREGNANCIES COMPLICATED BY TYPE 1, TYPE 2 AND GESTATIONAL DIABETES AND REVEALED BY CUSTOMISED BIRTHWEIGHT CALCULATIONS

[2]JJS Waugh, [3]EL Lim, [1]T Burdon, [3]S Marshall, [2]JM Davison, [2]M Blott, [3]R Taylor. *[1]Directorate of Medicine, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [2]Directorate of Women's Services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [3]Institute of Cellular Medicine1, Newcastle University, Newcastle upon Tyne, UK*

Comparison of birthweight data between groups of women with type 1, type 2 and gestational diabetes (GDM) is confounded by ethnicity, maternal age and weight. The customised growth centile has not been applied to compare different diabetic groups.

We report a prospective longitudinal 5-year (1 January 2000–31 December 2005) single-centre study of 217 consecutive singleton births in insulin-treated diabetic women during pregnancy.

The type 2 group were older, heavier and higher parity compared with the type 1 group and contained significantly more Asian women (17.4 kg mean difference in booking weight!). Rates of fetal growth, by ultrasound biometry, were similar in all groups. Mean birthweights were 3.49 ± 0.69, 3.49 ± 0.65 and 3.54 ± 0.56 kg for the type 1, type 2 and GDM groups, respectively (non-significant). Examination of birthweight distribution (large-for-gestational-age and small-for-gestational-age) suggested more small-for-gestational-age babies in the type 2 group, balanced by a smaller number of babies over 4000 g. However, when corrected for maternal weight, ethnicity, gestational age, fetal sex and parity, the mean customised centile for babies was 71, 72 and 65 for babies born to type 1, type 2 and GDM mothers, respectively. The greatest influence was ethnicity. Both neonatal hypoglycaemia and special care baby unit admission were overrepresented in type 2 (39.3% type 2 versus 28.6% type 1 and 17% GDM) but only half were associated.

Customised growth measurements clearly indicate an increased prevalence of macrosomia in all groups but the perinatal consequences of this vary depending upon the maternal phenotype.

PMM.26 ANTENATAL SUPPORT AND REASSURANCE FOR LOW-RISK NULLIPAROUS WOMEN

[1]VJ Smith, [2]J Hewison, [3]C McParlin, [1]IN Steen, [1]M Deverill, [1]SC Robson. *[1]Newcastle University, Newcastle upon Tyne, UK; [2]University of Leeds, Leeds, UK; [3]Newcastle upon Tyne Hospitals NHS Trust, Newcastle upon Tyne, UK*

Background: The number of antenatal visits provided to low-risk nulliparous women have been reduced as recommended by NCCWCH. It was recognised that this may result in more anxiety and less satisfaction with care. We hypothesised that the provision of proactive telephone support with or without information about placentation (from uterine artery Doppler (UAD) screening) would reduce the number of unscheduled visits women make.
Methods: 840 low-risk nullips were randomly assigned into a control (C) group, who received standard care, a telephone (T) group, who received a telephone call from a midwife at 28, 33 and 36 weeks, and a telephone plus UAD (T+D) group who received additional UAD screening at 20 ± 24 weeks' gestation. Secondary outcomes were anxiety (state trait anxiety inventory; STAI), satisfaction with care (Six Simple Questions Scale) and social support (Duke–UNC Social Support Scale).
Results: The median (interquartile range) number of unscheduled and scheduled visits was similar in the three groups (C; 2.0 (1–4), T 2.0 (1–4), T+D 2.0 (1–3), $p = 0.56$ and C 7.0 (6–7), T 7.0 (6–7), T+D 6.0 (6–7), $p = 0.44$, respectively). Additional support was not associated with differences in mean (SD) STAI at 36 weeks (C 36.7 (10.9) versus T 37.1 (10.3), T+D 36.2 (9.9)) social support or satisfaction. 1.8% of women had positive UAD screening at 24 weeks. The prevalence of pre-eclampsia (3.5%) and birthweight <5th centile (3.9%) were similar in each group.
Conclusions: Provision of proactive telephone support with or without UAD does not reduce unscheduled antenatal visits, affect levels of anxiety, social support or satisfaction.

PMM.27 DON'T THROW THE BABY OUT WITH THE BATH WATER! IS THERE STILL A PLACE FOR UNIVERSAL SCREENING FOR GESTATIONAL DIABETES?

[1]D Sen, [2]R Taylor, [2]S Marshall, [1]JM Davison, [1]JJS Waugh. *[1]Directorate of Women's Services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [2]Institute of Cellular Medicine1, Newcastle University, Newcastle upon Tyne, UK*

Screening strategies for gestational diabetes (GDM) remain controversial. Recent guidelines from the National Institute of

Health and Clinical Excellence (NICE; in draft for consultation) support a targeted risk-based approach of a 75 g oral glucose tolerance test (OGTT) (WHO criteria) at 24–28 weeks of pregnancy in women with risk factors (including pre-gestational BMI >30, previous baby weighing >4.5 kg, previous GDM, first degree relative with diabetes and high-risk ethnic group).

The northeast has a regional strategy of universal screening (non-fasting blood glucose at 28 weeks and >6.5 mmol/l used as cut-off for OGTT). All women with abnormal OGTT (WHO criteria) are reviewed. We evaluated the last 66 women thus diagnosed with impaired glucose tolerance (IGT) or GDM and assessed whether they would have been identified through NICE guidelines.

Twelve women (18.2%) had no risk factors suggested by NICE as triggers for screening. All women required dietary modification and home blood glucose monitoring. Five required pharmacological intervention (one insulin; four metformin). There were no adverse perinatal or neonatal outcomes. Seven of the 12 women required induction of labour, of which three had Caesarean sections. Three others had elective Caesarean for other obstetric reasons.

The ACHOIS trial[1] suggests that diet and monitoring is a necessary therapeutic intervention in IGT. This small study suggests that 12/66 (18.2%) women will be missed in our region if universal screening is abandoned. We propose a trial of parallel screening techniques to compare rates of IGT and GDM before modifying local and regional guidelines.

1. **Cowther CA,** Hiller JE, Moss JR, *et al*, ACHOIS trial group. *N Engl J Med* 2005;**352**:2477–86.

PMM.28 PRECOG DAY ASSESSMENT UNIT GUIDELINES: A PROSPECTIVE AUDIT DEMONSTRATES SAFETY AS WELL AS CLINICAL EFFICACY

[1]JJS Waugh, [1]P Taylor, [2]SC Robson. *[1]Directorate of Women's Services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [2]School of Surgical and Reproductive Sciences, Newcastle University, Newcastle upon Tyne, UK*

PRECOG have produced guidelines for the ''step-up''assessment of hypertension and proteinuria in obstetric day units following their community guideline launch in 2005. These guidelines have been used in the day unit in Newcastle upon Tyne for the past 12 months and data gathered prospectively.

242 women made 501 visits (range 1–16; gestation 22–42 weeks) with blood pressure $\geq 140/90 \pm \geq 1$ mm Hg plus proteinuria (community screen positive). Guidelines confirmed hypertension in 231 46% and 16 were admitted immediateley for blood pressure >160/110 mm Hg on their first visit. Dipstick proteinuria was confirmed in 282 women, who underwent a protein : creatinine ratio of which 166 were ≥30 mg/mmol. This group went on to collect 24-h urine samples and 82.5% were greater than 300 mg/24 h.

Following assessment 26% were admitted with a diagnosis of pre-eclampsia. 39% were followed up in the day unit, of whom 30% developed pre-eclampsia requiring admission (mean number of visits four; mean duration to develop pre-eclampsia 8 days from pregnancy-induced hypertension (PIH) and 17 days from gestational proteinuria). 21% remained with PIH and 6% with gestational proteinuria. 40% were deemed normal after assessment and of these 51% re-presented (16% developed pre-eclampsia and 29% developed PIH).

Six women developed haemolysis–elevated liver enzymes–low platelets and 14 women required intrapartum pre-eclampsia protocol for delivery. Mean gestation at delivery was 36 ± 3 weeks. There were no maternal intensive therapy unit/high dependency unit admissions and no stillbirths or perinatal deaths.

This day unit protocol provides a safe and efficient way of caring for hypertension in pregnancy and its efficiency is maximised by having ''same day'' protein : creatinine ratio urine tests.

PMM.29 THERAPEUTIC MANAGEMENT OF PRE-ECLAMPSIA IN THE UNITED KINGDOM

S Enye, L Chappell, A Briley, P Seed, L Poston, A Shennan. *King's College, London, UK*

Objective: To determine the use of therapeutic interventions in the prophylaxis and management of pre-eclampsia.
Design: An analysis of a large prospectively validated database of high-risk women recruited into the Vitamins in Pre-eclampsia Trial in 25 hospitals in the United Kingdom.
Methods: Twenty-five hospitals were grouped into six geographical regions. The uptake of low-dose aspirin according to risk factor was determined in the entire cohort of 2404 women recruited into the trial. In the 368 women who subsequently developed pre-eclampsia, the use of antihypertensive therapy and magnesium sulphate was determined and assessed.
Results: 23% (563/2395) of women with known risk factors at trial entry received low-dose aspirin. 54% (31/57) of women with three risk factors had aspirin at trial entry. 46% (50/107) of women who subsequently developed pre-eclampsia had received low-dose aspirin. Aspirin prophylaxis ranged from 8% in Leeds/Bradford to 48% in Leicester. 52% (69/131) of the women were treated with antihypertensives following the onset of pre-eclampsia. The use of antihypertensive treatment ranged from 16% in Birmingham to 48% in Kent. 23% (5/21) of those with a maximum diastolic blood pressure above 110 mm Hg were not given any antihypertensive therapy. 53 women (14%) with pre-eclampsia received magnesium sulphate prophylactically. The regional uptake of magnesium sulphate in pre-eclamptic women ranged from 5% (Birmingham) to 30% (Manchester).
Conclusions: There are wide variations in practice with regard to aspirin, antihypertensives and magnesium sulphate use, related to geography and risk status in the United Kingdom.

PMM.30 WEST MIDLANDS CONFIDENTIAL ENQUIRY INTO PRE-GESTATIONAL DIABETES IN PREGNANCY: ANALYSIS OF PERINATAL DEATHS

N Shah, P Brydon, J Gardosi. *West Midlands Perinatal Institute, Birmingham, UK*

The West Midlands Perinatal Institute facilitated a region-wide confidential enquiry involving analysis of pre-selected cases and controls (n = 77) from the UK CEMACH programme into pregnancy in women with type 1 and type 2 diabetes in 2002–3. The perinatal mortality rate for mothers with pre-gestational diabetes in the West Midlands is more than fourfold higher than the regional general maternity population.
Methods: This study aimed to identify antenatal risk factors for cases resulting in stillbirth (n = 15) or neonatal death (NND; n = 3) included in the confidential enquiry and to compare care provided against controls (alive at 28 days/no major congenital anomaly, n = 38).
Results: Non-Europeans had a significantly greater risk of perinatal death when compared with the European group (relative risk 2.5, $p<0.01$). Half of all stillbirths occurred post term with an equal risk in each completed week of gestation from 37 to 40 weeks. A history of previous preterm delivery was significantly associated with stillbirth/NND in multiparous women (64% versus 12.5%, $p<0.01$). Poor glycaemic control, assessed by median haemoglobin A1c (HbA1c) pre-pregnancy and in each trimester, was also associated with stillbirth/NND with no congenital anomaly. This reached significance in the first and third trimesters (HbA1c 7.8% and 7.2%, respectively) when compared with panel controls and the larger full West Midlands cohort of live births.
Conclusions: Risk factors including ethnicity and previous preterm delivery together with suboptimal glycaemic control can be used to identify pregnancies at increased risk of perinatal loss and to target diabetic and obstetric interventions to reduce this risk.

PMM.31 THE RISK OF INTRAUTERINE GROWTH RESTRICTION IN WOMEN WITH CARDIAC DISEASE TREATED WITH BETA-BLOCKERS

K Herbert, J Trinder. *St Michael's Hospital, United Bristol Healthcare Trust, Bristol, UK*

Some women with cardiac disease are given beta-blockers, either as treatment or as a preventive measure. The majority of these women have good cardiac function, which should not adversely affect fetal growth. Use of beta-blockers in pregnancy, as treatment for hypertension, is associated with a small risk of intrauterine growth restriction (IUGR). We aimed to audit the incidence of IUGR in women with cardiac disease receiving beta-blockers. Patients on beta-blockers were identified from the joint cardiac antenatal clinic at St Michael's Hospital, Bristol (2005–6). The 11 women had varying diagnoses; repaired coarctation (3), mild cardiomyopathy (3), dilated aortic roots (3), left ventricular dysfunction (1) and arrythmia (1). Only one woman had poor cardiac function. The babies of 7/11 (64%) women had IUGR based on <10th centile sex-specific birthweight charts. IUGR had been pre-diagnosed on ultrasound scan in six fetuses. Oligohydramnios was present in five women. One woman had oligohydramnios but not IUGR on scan, although the baby was subsequently <10th centile at birth. Overall birthweights ranged from 1800 g to 3890 g. Of the seven women with IUGR, four had been on beta-blockers from pre-pregnancy, three had started atenolol at 20, 23 and 31 weeks' gestation. The only identifiable explanation for IUGR in these seven women was beta-blockade therapy. The only women with poor cardiac function had a baby with birthweight >50th centile.

Conclusions: There appears to be a concerning trend that pregnant women with cardiac disease who are treated for long periods of time with beta-blockers may be at more risk of IUGR than current evidence suggests.

PMM.32 HOW ACCURATE IS THIRD TRIMESTER ULTRASOUND IN PREDICTING BIRTHWEIGHT/CENTILE IN DIABETIC WOMEN IN A MULTI-ETHNIC POPULATION?

S Sharma, N Shah, K Barber, P Dyer. *Birmingham Heartlands Hospital, Birmingham, UK*

Introduction: Macrosomia occurs in 25–42% of diabetic pregnancies and is associated with significant neonatal and maternal morbidity.

Aim: To compare the estimated fetal weight/centile by scan at 34 weeks with actual birthweight/centile at delivery in a large inner-city, multi-ethnic diabetic antenatal clinic.

Results: Data were collected on 50 diabetic pregnancies taking insulin for demographic details, estimated fetal weight at 34 weeks, gestation/mode at delivery and actual birthweight and birth centile based on a customised chart. 86% of women had gestational diabetes, with 72% being of Asian ethnicity (predominantly Pakistani). In 40% of women the scan estimated fetal weight was above the 90th centile at 34 weeks. Mean centile at 34 weeks was 67.5 (SD 30.8), whereas mean customised centile at birth was 63.0 (SD 36.7). Estimated weight centile at 34 weeks was comparable to the weight centile at birth in our study. Mean actual weight was 3261 g, whereas mean predicted weight was 3418 g. The mean absolute error was −154 g (SD 396 g). 64% of women underwent induction of labour, 14% had spontaneous onset of labour and 22% elective Caesarean section (none for fetal macrosomia as a primary indication). 58% of women achieved a vaginal delivery, 47% when the predicted weight was above the 90th centile. There were no instances of serious fetal morbidity or trauma secondary to macrosomia in this cohort.

Conclusions: In our study, with a large Asian population, third trimester ultrasound accurately predicted birthweight, on average to within 150 g or five customised growth centiles.

PMM.33 OUTCOMES AND ADVERSE EVENTS OF PREGNANCIES IN WOMEN WITH PROSTHETIC HEART VALVES AND THERAPEUTIC ANTICOAGULATION

K Collins, J Trinder. *St Michael's Hospital, United Bristol Healthcare Trust, Bristol, UK*

We aimed to determine outcomes and adverse events in pregnancies of anticoagulated women with prosthetic heart valves. Pregnancies in these women attending the cardiac antenatal clinic at St Michael's Hospital, Bristol, in 2003–7 were identified and reviewed: 16 pregnancies (nine women) were identified. Four women (seven pregnancies) had aortic valves, three women (six pregnancies) had mitral valves, one woman (two pregnancies) had a tricuspid valve and one woman (one pregnancy) had both mitral and aortic prosthetic valves.

In 11 pregnancies, the women received warfarin throughout the pregnancy (warfarin group). In one pregnancy the woman received low molecular weight heparin (LMWH) and aspirin throughout the pregnancy (LMWH group). In four pregnancies the women received warfarin until approximately 6 weeks' gestation, LMWH until 14 weeks and warfarin again until induction or onset of labour (combination group).

Results: The patient in the LMWH group developed mitral thrombosis at 36 weeks' gestation, despite therapeutic anti-Xa levels. Other maternal complications included two postpartum haemorrhages (one in the warfarin group and the other in the LMWH group). There were six live births over 34 weeks' gestation; seven first trimester miscarriages (five warfarin group, two combination group) and one termination (warfarin group). There were two second trimester miscarriages (one in combination and one in the warfarin group at 20 weeks, in which postmortem confirmed warfarin embryopathy).

Conclusions: Few conclusions can be drawn from these limited data, nevertheless adverse events were common. Pregnancies in women with prosthetic valves remain relatively rare. A multicentre approach to data collection is recommended.

PMM.34 A LONGITUDINAL ANALYSIS OF PREGNANT SUBSTANCE MISUSERS ATTENDING ANTENATAL SERVICES: DOES SPECIALIST CARE IMPROVE OUTCOMES?

[1]K Bristow, [3]F Ibrahim, [2]P Moran, [1]E Kaner, [1]J Rankin, [3]E Gilvarry, [2]M Findlay. *[1]Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK; [2]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; [3]Northumberland Tyne and Wear NHS Trust, Newcastle upon Tyne, UK*

Introduction: Established in 2002, the Newcastle upon Tyne Multidisciplinary Addictions Antenatal Service provides a unique opportunity to monitor changing patterns of substance misuse and pregnancy outcomes.

Methods: A longitudinal analysis of case-note data from women attending this specialist clinic during 2002 (when it was established) and 2005/6.

Results: 83 women were referred over a 6-month period in 2002 and 68 over a 3-month period in 2005/6; an increased average of 14 to 22 per month. The age range in both cohorts was similar (17–39 years). In 2002, the primary drugs used were heroin (65%), alcohol (23%) and benzodiazepines (13%). In 2005/6, they were heroin (50%), alcohol (24%), stimulants (15%) and cannabis (11%). Mean gestational age at booking for opiate users improved from 18 to 16 weeks and from 28 to 15 weeks for non-opiate users. Between 2002 and 2005/6, there were fewer neonatal admissions to special care (26% to 20%) but similar rates of neonatal abstinence syndrome ''NAS'' (both 23%). In 2002, 22% women delivered before 37 weeks compared with 5% in 2005/6. In 2002, 95% babies born to alcohol and opiate users were below the 50th centile for birthweight compared with 81% in 2005/6.

Conclusions: Pregnant substance misusers presented earlier to the clinic and accessed more antenatal care. Preterm delivery rates and

infant birthweights were improved, highlighting the benefit of specialist antenatal care. Changing patterns of substance use, particularly increased stimulant use and the failure to reduce NAS levels represent a continuing challenge for the clinic.

PMM.35 DON'T OVER EGG THE PUDDING: PUTTING OBESITY RISK IN CONTEXT

M Smith, JJS Waugh. *Directorate of Women's Services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK*

The recent UK Confidential Inquiry ''Saving mothers' lives'' (2003–5) emphasised the increasing contribution of obesity to adverse maternal outcomes in pregnancy. The report states that ''obese pregnant women with a body mass index (BMI) over 30 kg/m^2 are far more likely to die''. We were concerned that the BMI categories used in the report were too broad to determine accurately the threshold above which risk was increased.

Closer examination of the Health Survey for England data (n = 1584), used by CEMACH to predict the distribution of BMI in the antenatal population, indicates that an increased risk of maternal mortality might be confined to women with a BMI >35. We have compared the BMI distribution in our own antenatal population (n = 4364) with the cohort of cases in the CEMACH report (n = 231).

The proportion of women with a BMI >40 kg/m^2 was significantly increased in the CEMACH group compared with our antenatal population (8.2% versus 1.8%; 95% CI 2.8% to 10%). There was no significant difference in BMI distribution in any other category.

When the incidence of obesity is steadily increasing, any policies that promise additional healthcare for women with moderate levels of obesity will have considerable resource implications. More data are required to define accurately the risks of obesity to power and design intervention trials appropriately. Additional indicators of maternal and neonatal morbidity will be considered when clinical recommendations for the management of obesity in pregnancy are produced, but we should be careful to avoid unnecessary intervention in pregnancies not proved to be at increased risk.

PMM.36 OBSTETRIC OUTCOME IN WOMAN WITH SPINAL CORD INJURIES

[1]P Manda, [1]M Mecci, [2]JJS Waugh. *[1]South Tees Hospitals NHS Trust, South Teeside, UK; [2]Directorate of Women's Services NUTH NHS Foundation Trust, Newcastle upon Tyne, UK*

This is a retrospective study of pregnancy and labour in women with spinal cord injuries in the northern region. We report on 13 women post-spinal cord injury who had 25 pregnancies. There were nine paraplegic women and four quadriplegic women. Three pregnancies were spontaneously miscarried. The babies (22) were near normal or normal weight. One baby died soon after delivery with multiple congenital abnormalities. Another baby had mild left hemiparesis.

Most of the women booked in the first trimester and had shared care from their local hospital. Recurrent urinary tract infection occurred at some point during pregnancy in all except one woman. 31% (7) of pregnancies were complicated with iron deficiency anaemia. One women required admission for increased spasticity during pregnancy and required large amounts of muscle relaxants. Elective admissions occurred in only four pregnancies as a precautionary measure for threatened preterm labour or previous precipitate labours. Three women had antepartum haemorrhage, which required hospital admissions. Two had deep vein thrombosis, two pre-eclampsia and one developed gestational diabetes requiring insulin treatment. 63% of pregnancies ended in vaginal delivery. Caesarean section was performed on 37% (eight pregnancies). Abnormal presentations occurred in 9% (2) of pregnancies. Epidural anaesthesia was selected for four deliveries; no regional analgesia was required for 10 vaginal births. Seven patients received no anaesthesia for their Caesarean sections and one had a general anaesthetic. All the women had uneventful puerperium except one women whose blood pressure was raised but did not require any treatment.

PMM.37 PEOPLE'S UNDERSTANDING OF THE TERM ''OBSTETRICIAN''

[2]C Kenyon, [2]D Siassakos, [1]T Draycott, [3]R Fox. *[1]Southmead Hospital, Bristol, UK; [2]University of Bristol, Bristol, UK; [3]Taunton and Somerset Hospital, Taunton, UK*

Background: Obstetric litigation currently represents 20% of all NHS litigation claims and 80% of the claim value. With current emphasis on improving obstetric services and added media pressure, this project endeavoured to address people's understanding of the term ''obstetrician'' and its connotations.
Methods: 86 questionnaires were completed by women attending antenatal clinics. The study was reviewed by the chair of the ethics committee and was deemed appropriate to be conducted within our health service evaluation framework.
Results: 10 women had not heard the term before and a further 40 did not know its meaning, but 39% of the women surveyed (33) had already had conversations with staff who had used the term. Women were asked whether in those conversations the term had been explained to them. This was the case for only half of them. Women also described their perception of the term. 53% described neutral connotations, 17% of comments were negative and 30% positive. Overall, less than one tenth felt that the term ''obstetrician'' was used appropriately. Despite this, just over half showed no preference over whether the term ''obstetrician'' should be replaced with a more suitable one and only one third preferred ''maternity specialist'' or ''maternity doctor''.
Conclusions: Lay understanding of the term ''obstetrician'' varies. In light of the negative associations with the term, staff should seek to ensure that service users understand the service an ''obstetrician'' provides as well as to dispel any beliefs linked with the position.

PMM.38 TYPE 1 AND TYPE 2 DIABETES MELLITUS IN PREGNANCY: IMPORTANCE OF PREGNANCY PLANNING

[1]PJ Curtis, [2]C Conner, [2]A Rees. *[1]Cardiff University, Cardiff, UK; [2]Cardiff and Vale NHS Trust, Cardiff, UK*

Diabetes mellitus is well documented to be associated with many maternal and fetal risks such as stillbirth, major congenital anomalies and macrosomia. There have been many studies concluding good glycaemic control, particularly periconceptionally, can reduce these adverse events. As the prevalence of diabetes increases, leading to more women of childbearing age with diabetes, it is important to broach this issue as potential adverse outcomes could be prevented.
Aim and Objectives: To study awareness of the importance of planning pregnancies in women with pre-existing type 1 and type 2 diabetes mellitus and consider effective strategies to improve awareness and therefore overall outcome of these pregnancies.
Design: Questionnaires were given to gravid patients with pre-existing diabetes in the medical antenatal clinics of two hospitals and interviews were carried out. GP surgeries were sent questionnaires and discussions were held with secondary care doctors to assess current practice.
Results: 17 patients completed questionnaires and 12 were available for interview. 12 out of 47 GP surgeries returned questionnaires. 75% of pregnancies were unplanned. Only five out of 12 patients had achieved a haemoglobin A1c of <7% by the end of the first trimester. Nearly half of GP surgeries did not discuss contraception with their patients as part of their diabetic review.
Conclusions: Awareness of the importance of diabetic women to plan pregnancies is suboptimal. Patients and doctors agreed that

whoever supplied pre-pregnancy information needed to be easily accessible and that a verbal discussion backed up with an easy to understand leaflet was best.

PMM.39 PREGNANCY IN WOMEN WITH TYPE I AND TYPE II DIABETES AT SINGLETON HOSPITAL, SWANSEA 2004–6

H Faisel, R Padmagirson, M Morgan. *Swansea NHS Trust, Swansea, UK*

Objective: To examine the quality of antenatal care and outcome of diabetic women delivering at Singleton Hospital 2004–6 against national figures.[1]
Results: Notes of 70% of cases were found and reviewed. Singleton Hospital provided better preconception care compared with the national figures: haemoglobin A1c (HbA1C) was tested in 82% of mothers (37% nationally), 63% of cases had preconception folic acid (34% nationally). First trimester scans were performed in 87% of cases (73% nationally) and 20 weeks detailed scans were performed in 100% of cases (97% nationally). Steroids were provided in 100% of cases delivered before 34 weeks (70% nationally). Glycaemic control (both HbA1C level and percentage of patients with a level of less than 7) was better at Singleton in the preconception, first and second trimester but there was a tendency to worsening control during the third trimester. 50% of cases were delivered by elective Caesarean section (30% nationally) and 29% had emergency Caesarean section (38% nationally). There were no stillbirths during the 3 years (national figures were 25.8 per thousand for type I and 29.2 for type II). 41% of babies of type I (44% for type II) mothers were admitted to the special care baby unit.
Conclusions: Singleton Hospital seemed to provide higher standards of care and better fetal outcomes compared with national figures. The availability of a multidisciplinary diabetic antenatal clinic, with 24-h access to the diabetic nurse, helps achieve better glycaemic control. There is a potentially good uptake of preconception counselling. Worsening glycaemic control in the third trimester occurs at a time of increased monitoring and may be responsible for the increased Caesarean section rate.

1. **CEMACH**. Pregnancy in women with type 1 and type 2 diabetes in 2002–2003, England, Wales and Northern Ireland, October 2005.

PMM.40 EXTERNAL CEPHALIC VERSION: THE PATIENT'S PERSPECTIVE

AL Roberts, AS Olawo. *Rotherham District General Hospital, South Yorkshire, UK*

The offer of external cephalic version (ECV) to mothers with a term breech baby is recommended by the Royal College of Obstetrics and Gynaecology. Women who underwent ECV within the preceding year were sent a postal questionnaire about their experiences.

20% of the women who responded had a successful ECV. 13% had a vaginal delivery, 67% had an elective Caesarean section and 20% had an emergency Caesarean section.

Women were asked about the quality of preprocedure counselling, their experience of ECV itself and their overall ''birthing'' experience. 33% felt that they were unprepared for the procedure. 74% felt they were given adequate information about their options. Almost three-quarters of women found the procedure painful, with 27% finding this unacceptable.

The results highlighted the importance of good preprocedure counselling. The individuals' perspective should be acknowledged when performing ECV as pain thresholds differ markedly.

PMM.41 IMPROVING MANAGEMENT OF ANTENATAL CORTICOSTEROIDS IN WOMEN WITH DIABETES

R Jewell, L Walker, J McKenzie, RS Lindsay, F Mackenzie. *Princess Royal Maternity, Glasgow Royal Infirmary, Glasgow, UK*

Corticosteroid use in women with diabetes may be complicated by hyperglycaemia and ketoacidosis. We evaluated a simple protocol (modified from Mathiesen *et al*)[1] designed to reduce the length of inpatient stay and the need for intravenous insulin (previously used in all women with type 1 diabetes (T1DM) in our unit after betamethasone) and extended its use to women with gestational (GDM) and type 2 diabetes (T2DM) (see table for protocol).

Abstract PMM.41 Protocol

Day	Betamethasone	Insulin dose (units) increase over baseline
1	12 mg im	Doses 8–24 h later on same day increased 10% (short acting) or 25% (long acting)
2	12 mg im	40%
3		40%
4		20%
5		10%
6+7		Reduce to baseline

im, intramuscularly.

Betamethasone was given to 23 patients (11 T1DM, one T2DM, 11 GDM). Subcutaneous insulin doses were increased (mean ± SD) on days 2–4 by 45.3 ± 11.6%, 42.5 ± 6.2% and 21.8 ± 9.3%, respectively. No woman experienced hypoglycaemia. Intravenous insulin was used in four women (three T1DM, one GDM) for clinical reasons unrelated to the protocol (one emergency delivery, two vomiting, one non-compliance). Intravenous insulin was used in 6/19 women (32%: three women blood sugar >12 mmol/l; three women development of ketonuria). Intravenous insulin was used less often in women with T1DM (one of eight women) than T2DM or GDM (five of 11 women; $p = 0.25$).

This early experience suggests that prophylactic increases in insulin doses supported by protocol can be safely applied without hypoglycaemia. It is likely that larger increases in insulin doses would be more effective in women with GDM and T2DM.

1. **Mathiesen** *et al*. *Acta Obstet Gynecol Scand* 2002.

PMM.42 IMPACT OF PERSISTENT RENAL GLYCOSURIA ON THE OUTCOMES OF PREGNANCY IN WOMEN WITH NORMAL GLUCOSE TOLERANCE TEST

A Gumma, R Ratnachalam. *University Hospitals of Coventry and Warwickshire, Coventry, UK*

Methods: Retrospective audit of 50 patients with persistent glycosuria at George Eliot Hospital from May 2006 to 2007. 46% of the patients had a glucose tolerance test (GTT) done at 24–26 weeks due to previous history of gestational diabetes or family history and had a normal result.
Results: The majority of the patients were in the age group 20–25 years. 32% were primigravida and three out of four patients had BMI <35. 8% of the patients had a previous history of gestational diabetes. 52% of the patients had three or more episodes of glycosuria. Repeat GTT or random blood glucose was tested in 35/50 patients and the result was normal. 22% had urinary tract infections of more than episodes. Growth scans were performed in 40%. Pregnancy-induced hypertension and polyhydramnios was noted in 14%. Mode of delivery was by Caesarean section in 56%. 18% had postpartum haemorrhage and postoperative infection occurred in 26%. Macrosomia was noted in 40% and special care baby unit admission occurred in 6% of neonates.
Conclusions: Renal glycosuria in pregnancy is a known entity and physiological phenomenon. It was thought to be benign with no adverse effects. In our study, we noted that the antenatal outcomes are similar to those of gestational or type 1 diabetes. Neonatal outcomes were equal to those of the non-diabetic pregnant population. It is clear from this small study, that ''benign renal glycosuria of pregnancy'' is not so benign but needs to be taken seriously and measures should be taken to optimise the outcomes.

PMM.43 SEROEPIDEMIOLOGICAL STUDY OF CYTOMEGALOVIRUS INFECTION IN PREGNANT WOMEN REFERRED TO VALIASR HOSPITAL, KAZEROON, FARS, IRAN

M Tabatabaee. *Islamic Azad University, Kazeroon Branch, Kazeroon, Fars, Iran*

Background and Aim: Cytomegalovirus causes the most common congenital viral infection. The seroprevalence of cytomegalovirus among the adult population shows significant geographical variability. Different studies conducted on this subject have come to various conclusions in Iran. For example, research done in Tehran indicates that 100% of pregnant women and 98.9% of women aged 14–45 years were cytomegalovirus IgG positive, whereas the incidence of this immunity in pregnant women in Kermanshah, in the west of Iran, was 23%. With regard to the above-mentioned studies and lack of exact information about this infection in Kazeroon, south of Iran, there was an attempt to study this in this region.
Material and Methods: A prospective study of pregnant women who were admitted to the delivery ward of the above hospital in Kazeroon, between March 2006 and March 2007. 1068 cases were selected randomly. The evaluation of anti-cytomegalovirus IgG and IgM were carried out.
Results: The results showed that cytomegalovirus IgM was positive in 4.35% and cytomegalovirus IgG was positive in 97.83% of samples.
Discussion: The findings reveal results like most of the other Iranian studies. Similar findings were acquired in Israel (84.3%) and Egypt (96%). According to these findings, screening for cytomegalovirus infection in the period of pregnancy is not required in this region. Therefore the medical community should not be alarmed about the danger or sequel of congenitally acquired cytomegalovirus infection in Kazeroon.

PMM.44 TREND OF OBESITY IN AN OBSTETRIC POPULATION

SI Omisakin, S Ghoshal, AO Jaiyeola, O Amu. *The Royal Oldham Hospital, Oldham, UK*

Aim: To study the trend of obesity in an obstetric population.
Background: There have been public health concerns about possible rising rates of obesity in the United Kingdom and the potential health implications. Over half of all the women in the latest CEMACH who died from direct and indirect causes were either overweight or obese.
Methods: A retrospective analysis of databases in the Euroking system of all pregnant women who attended the obstetric unit of the Royal Oldham Hospital was performed. Information on obese women in 2002 and 2006 was extracted and analyzed.
Results: There was a twofold increase in the total number of obese women over the 5-year period. The age distribution and body indexes were similar in both years of the study; the majority of women were aged between 20 and 34 years. There was a 91% increase in the population of grossly obese women. Two-thirds of these women were mildly obese. There was no change in birthweight pattern in the study group as a whole; in particular, there was no predominance of fetal macrosomia in morbidly obese women. However, there were more operative interventions in the grossly obese compared with the mildly obese population. There was over a 40% increase in the risk of Caesarean section in this obese obstetric population compared with the general parturient population.
Conclusions: Obesity is an epidemic, unequivocally hazardous to the pregnant woman and her fetus. The importance of purpose-directed preconceptual health education in these women cannot be overemphasised.

PMM.45 "THYROTOXICOSIS IN PREGNANCY": 10 YEARS' EXPERIENCE

A Juliana, R Page, A Simm. *Nottingham University Hospitals NHS Trust (City Campus), Nottingham, UK*

Thyrotoxicosis occurs in one in 500 pregnancies. Pregnant women not treated appropriately have a higher occurrence of intrauterine growth restricted (IUGR) babies, preterm deliveries and perinatal mortality.
Aim: To investigate the outcome in women who had had a diagnosis of thyrotoxicosis either before or during pregnancy. Women attended a consultant-led joint endocrine obstetric antenatal clinic. We also investigated the difference in outcome in four different categories of thyrotoxic women: (1) propylthiouracil; (2) carbimazole; (3) thyroxine replacement following treatment of thyrotoxicosis and (4) not on any treatment.
Methodology: Patients diagnosed with thyrotoxicosis either before or during pregnancy between 1997 and 2007 were included. Data on women were collected at each clinic visit by the endocrinologist. Obstetric data were obtained through retrospective case note analysis.
Discussion: 106 patients were identified for the study. 98 notes were reviewed. There was 12.7% incidence of preterm labour, 21.5% risk of IUGR. Occurrence was slightly higher in the actively thyrotoxic group compared with the others (27% compared with 18%). There was no difference between the propylthiouracil or carbimazole groups. The Caesarean section rate was 21.5%, slightly higher than our hospital average of 18%. Only one baby developed thyrotoxicosis.
Conclusions: Our study confirmed the high incidence of IUGR and preterm labour in thyrotoxic pregnant women, occurring even in women who were not actively thyrotoxic. Results suggest all women with a history of thyrotoxicosis should receive hospital-led care. The causes of IUGR require further investigation. The drug used did not affect the outcome.

PMM.46 PRELIMINARY EXPERIENCE WITH AMLODIPINE IN CHRONIC HYPERTENSION DURING PREGNANCY

[1]M Cole, [2]T Purewal, [1]S Walkinshaw. *[1]Liverpool Women's Hospital, Liverpool, UK; [2]Royal Liverpool University Hospital, Liverpool, UK*

Calcium antagonists are commonly used for the treatment of hypertension in pregnancy. Local experience with nifedipine suggested a high need for additional therapy and change in therapy secondary to side effects. Amlodipine is an alternative drug of the same class, taken once daily and reported to have a better side-effect profile. There is little information on its use during pregnancy.
Study Design: Case records of women and infants in whom amlodipine was prescribed before and during pregnancy or when started during pregnancy in women with known pre-existing hypertension attending a pregnancy hypertension service were reviewed. Data on dosage, need for other treatment, side effects and development of pre-eclampsia were extracted. Data on gestation, birthweight, cord pH, admission to neonatal intensive care unit, hypoglycaemia, jaundice, feeding choice and difficulties, blood pressure problems, hypothermia and respiratory complications were extracted from the baby's records.
Results: 10 women had completed pregnancies. Two women developed severe pre-eclampsia requiring high dependency unit (HDU) care and three required additional antihypertensive drugs (including the two requiring HDU care). Three women reported headache but continued with treatment. One had persistent nausea with vomiting but continued treatment. Two of nine infants born at term developed hypoglycaemia requiring treatment but no other complications were recorded before hospital discharge. Six women breast fed, one exclusively.

Conclusions: Preliminary experience suggests amlodipine is well tolerated and is as effective as nifedipine. Its favourable side-effect profile is confirmed, with no woman needing to change therapy. Updated results on pregnancy outcomes and neonatal complications will be presented.

PMM.47 PRE-PREGNANCY COUNSELLING FOR WOMEN WITH EPILEPSY: IS THERE A NEED FOR IMPROVEMENT?

R Kumar, S Siddiki, A Norman, A Nicoll. *Ninewells Hospital, Dundee, UK*

Background: The recently published CEMACH document Saving mothers' lives highlights the need for effective pre-pregnancy counselling for women with epilepsy.
Aims: To identify the number of pregnant women with epilepsy who had received pre-pregnancy counselling and to examine obstetric outcomes of pregnant women with epilepsy.
Methods: All women who attended the combined epilepsy antenatal clinic at Ninewells Hospital in Dundee between 1 January 2005 and 31 May 2007 were included (n = 64). Only 46 notes were obtained, number of pregnancies 49.
Results: 11/49 (22.4%) had received pre-pregnancy counselling. 42/49 (85%) were taking folic acid at booking, but only 22/42 (52%) were taking 5 mg tablets. 14/49 (28.5%) were not taking any antiepileptic drugs (AED). 30/49 (61%) were taking one AED. 3/49 (6%) were taking two or more AED. 11/33 (33%) had changes to their AED during pregnancy. 44/49 (89%) had detailed ultrasound and 34/49 (69%) had third trimester ultrasound assessment of fetal biometry performed. 8/49 (16%) had seizures in pregnancy. The median gestational age of delivery was 40 weeks (range 16–42). 14/49 (28%) required induction of labour and 28/49 (57%) went into spontaneous labour. 29/49 (59%) of patients had spontaneous vaginal delivery, 13/49 (26.5%) were delivered by Caesarean section and 6/49 (12%) had operative vaginal delivery. Median birthweight was 3420 g (range 1900–4370). One (2.04%) patient had a late miscarriage at 16 weeks' gestation. One baby was diagnosed with ventricular septal defect, the mother was on carbamazepine.
Conclusions: The rate of pre-pregnancy counselling is low. Nevertheless most women with epilepsy will have successful pregnancy outcomes.

PMM.48 STUDY OF PREGNANT WOMEN WITH HYPOTHYROIDISM IN A DISTRICT GENERAL HOSPITAL

A Bouzaki, L Pinto, D Rich, AS Parveen. *Nevill Hall Hospital, Abergavenny, Gwent, UK*

Aim: To evaluate whether hypothyroid patients who are adequately treated with thyroxine require referral to and surveillance in a dedicated maternal medicine unit.
Methodology: This retrospective study reviewed 50 women with hypothyroidism during pregnancy.
Results: 90% (45) patients were hypothyroid before pregnancy and were treated with thyroxine. Five patients were diagnosed in pregnancy but two of these were lost to follow-up. 51% (23 out of 45) required increasing doses of thyroxine. The average increase in dosage of thyroxine was 60%. The incidence of hypothyroidism among pregnant women in Nevill Hall Hospital was 2% between 2005 and 2006 (72/3620 deliveries). Chronic autoimmune thyroiditis is the main cause of hypothyroidism in pregnancy (55%).[1 2] In our study, 46% (23) had thyroid peroxidase antibodies (antithyroid peroxydase antibody (ATPO) positive). 88% of patients attended the medical antenatal clinic. 52% of all patients had regular growth scans including all ATPO-positive patients. 4% developed pregnancy-induced hypertension and 2% developed obstetric cholestasis. No intrauterine growth retardation was identified and all had a good neonatal outcome. There was no case of postpartum thyroiditis. In ATPO-positive pregnant women, 13% had neonatal hypothyroidism detected in the neonatal period.
Conclusions: We conclude that pregnant women who are adequately treated with thyroxine to the euthyroid state do not require referral to a specialist maternal medicine unit for pregnancy surveillance.

1. **Allan WC,** Haddow JE, Palomaki GE, *et al*. Maternal thyroid deficiency and pregnancy complications: implications for popular screening. *J Med Screen* 2000;**7**:127–30.
2. **Glinoer D,** Abalovich M. Unresolved questions in managing hypothyroidism during pregnancy. *BMJ* 2007;**335**:300–2.

PMM.49 PRECONCEPTION CARE IN MATERNAL MEDICINE: TIME FOR FRESH THOUGHTS?

[1]E Fairclough, [3]G Hawthorne, [2]J Mclaughlin, [1]JJS Waugh. *[1]Directorate of Women's services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [2]Policy Ethics and Life Sciences Research Centre, Newcastle upon Tyne, UK; [3]Newcastle PCT, Newcastle upon Tyne, UK*

CEMACH reports have highlighted the need for appropriate preconception services for women planning pregnancy with significant medical problems. The weight of clinical evidence is strongest for women with diabetes and this group has the greatest resource allocation.

Newcastle's obstetric medical team were concerned over the persistently high numbers attending the pregnancy diabetic service who had not accessed adequate preconception advice. We sought to explore this with a view to changes in service provision.

A postal questionnaire of all women who were between 18 and 40 years of age with either type 1 or type 2 diabetes (from the diabetic registry) was conducted (n = 313). From the respondents (n = 127) we found 44% had considered pregnancy or been pregnant in the past 5 years (the duration of our diabetic preconception clinic). 42 (76%) had received some preconception care: five from a GP; eight from a hospital general diabetic clinic; seven from a diabetic specialist nurse; 21 from a combination of the previous three and four from unknown sources. When asked if they knew of the prepregnancy clinic, 48% said "yes"; however, only 21% planned to attend as part of prepregnancy care.

A separate audit of the preconception clinic demonstrated the majority of attendees were white, primips, the average age was 34 years and average BMI 29.2 and 82% had type 1 diabetes.

Further work is required to determine the barriers to centralised multidisciplinary care environments and new strategies are required to reach out to at-risk groups who historically are poor at accessing health services.

PMM.50 MANAGEMENT OF PREGNANCY IN PATIENTS AT RISK OF AORTIC ARCH ABNORMALITIES

[1]G Harris, [2]J O'Sullivan, [2]D Crossland, [2]A Griffiths, [2]M Chaudhari, [3]J Waugh. *[1]Newcastle upon Tyne Medical School, Newcastle University, Newcastle upon Tyne, UK; [2]Directorate of Cardiology, Freeman Hospital, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK; [3]Directorate of Women's Services, NUTH NHS Foundation Trust, Newcastle upon Tyne, UK*

Introduction: This study looks at the management of pregnancy in two groups of women at risk of aortic arch dilation during pregnancy.
Methods: Records of patients with either Marfan syndrome (n = 4) or coarctation of the aorta (n = 14) were examined for compliance with current recommendations (CEMACH report).
Results: In the 18 women (28 pregnancies) mean maternal age was 25.31 years (range 15–45). All women had contact with the tertiary cardiology team before pregnancy but only 10 patients received prepregnancy counselling and 20 (69%) pregnancies were recorded as unplanned. Seventeen patients were referred to a tertiary obstetric department. In 10 pregnancies patients were seen in each trimester and in seven (25%) there was no cardiac review. Labour records were available in 10 cases and the mean length of second

stage of labour (n = 4) was 2.4 h. Three had Caesarean sections (two were urgent) and two were assisted. In five pregnancies cardiac review took place within 3 months of delivery. Seven women (38%) had a magnetic resonance imaging (MRI) scan before their first pregnancy and eight had an MRI post. There were no reports of significant change in the aortic dimensions.
Conclusions: Prepregnancy counselling is difficult in this group of patients as many pregnancies are unplanned. Cardiac surveillance during pregnancy often falls short of recommended guidelines. Delivery management varied considerably with respect to the management of the second stage and this may be due to the unpredictable time of delivery. The overall complication rate for this group of patients appears to be low.

PMM.51 TEENAGE PREGNANCY OUTCOME IN CAMBRIDGE UNIVERSITY HOSPITAL

B Vijayalakshmi. *Cambridge University Hospital, Cambridge, UK*

Objective: The objective of the study was to evaluate the obstetric, fetal and neonatal outcomes of teenage pregnancy in a tertiary care teaching hospital.
Methods: A retrospective audit was performed over a period of one year. Data were retrieved from hospital records. All teenage mothers (aged 13–19 completed years at delivery) delivering in the University Hospital were taken as cases.
Results: The incidence of teenage deliveries in hospital over one year was 3.1%. The majority of the teenagers were primigravida (83.2%). Complications included pregnancy-induced hypertension/pre-eclamptic toxaemia (3.6%), obstetric cholestasis 1.2%, anaemia 1.2%, premature onset of labour (25.25%). Teenage mothers also had an increased incidence of low birthweight (69%) and premature delivery (12.25%). The rate of Caesarean section was 14.1% and the instrumental delivery rate was 12.9%. The incidence of gastroschisis was 2.5%. Neonatal morbidities such as jaundice (5.7%), respiratory distress syndrome (1.9%), low Apgar scores was <3%. There was no neonatal mortality.
Conclusions: The results indicate that the major risk associated with teenage pregnancies is preterm labour, but the perinatal outcome is favourable. However, adverse pregnancy outcomes such as low birthweight and low Apgar scores were not significantly more frequent among teenage mothers. These findings fail to provide support for the view that teenagers have poorer obstetric and neonatal outcomes than adult mothers do. The good results accomplished in our centre could be attributed to the good, readily available prenatal care and the quality of support that is involved with the care of teenage mothers.

PMM.52 MULTIDISCIPLINARY TEAM WORKING: IMPLEMENTING NATIONAL RECOMMENDATIONS TO IMPROVE OUTCOMES FOR THE INPATIENT MATERNAL POPULATION

A Hancock, C Hulse, A Nafisi. *Mid-Cheshire Hospitals Trust, Crewe, UK*

Introduction: Recent confidential enquiries into maternal deaths (Lewis, 2003, 2007) recommend using early warning scores (EWS) in maternity hospital settings to warn of acute illness. This population raises challenges when physiological reserves can conceal life-threatening conditions. However, EWS alone are not sufficient to save mothers' lives; it is how practitioners respond to EWS that will determine changes in outcome.

At Mid-Cheshire Hospitals NHS Trust (MCHT) the practice development midwife and nurse consultant for critical care outreach service (CCOS) forged links between obstetric and critical care teams. Together they developed and introduced a modified EWS chart that was linked to a graded, multidisciplinary response strategy.
Methods: MCHT's existing EWS tool was modified for obstetric use. Parameters for vital signs recordings were standardised. A graded response algorithm incorporating specialist team referral was developed. Staff received training in EWS and patient assessment methods before and during the implementation phase. 3 months post-implementation: 100% compliance with EWS recording for women with length of stay >24 h. 100% EWS recording for Caesarean sections. 62% overall compliance with EWS recording. Early recognition of acute illness; timely referral to CCOS for three women was made. All were managed successfully on the delivery suite. Effective multidisciplinary team skill sharing averted admission to critical care.
Recommendations: Further development of EWS tool following feedback from staff. Regular training and audit. Further research into sensitivity and specificity of EWS for obstetric patients.

PMM.53 AUDIT OF PARENTERAL IRON TREATMENT DURING PREGNANCY IN A MULTI-ETHNIC POPULATION

S Kady, S Papaioannou. *Heart of England Foundation NHS Trust, Birmingham, UK*

Introduction: Iron deficiency anaemia is the most common cause of anaemia in pregnancy and is associated with reduced iron reserves. Because of the diverse causes of anaemia during pregnancy, it is undesirable to use haemoglobin as the sole means for diagnosis. Ferritin is the best reflection of iron reserve. We set out to audit the parenteral treatment of severe iron deficiency anaemia in pregnancy and the puerperium.
Methods: Retrospective audit of all patients (n = 28) who have received parenteral iron in 2006. Data were collected from hospital and computer records.
Results: The majority of patients (79%) were of non-European ethnic origin. The average haemoglobin pre-treatment was 7.9% and post-treatment was 9.1%. Three doses of parenteral iron (100 mg each dose) per week resulted in an approximate increase of 1 g in haemoglobin. In 54% of cases, treatment was in the late third trimester, with the indication of rapid treatment. One case required postnatal blood transfusion. Only six (21%) patients had the ferritin level checked before commencing parenteral iron therapy and none of the patients had the ferritin level checked post-treatment. Documentation was poor in 71% of the hospital notes.
Conclusions: The audit highlighted the need to adhere to strict protocols in the management of anaemia in pregnancy. Appropriate treatment may prevent unnecessary blood transfusions. However, parenteral iron treatment may be associated with serious side effects including anaphylaxis. Low haemoglobin may not reflect low iron stores and serum ferritin should be measured before parenteral iron is administered.

NNA: Nursing

PN.01 THE EFFECT OF POSITIONING ON THE TRANSITION FROM TUBE TO ORAL FEEDING IN PRETERM INFANTS: A PILOT STUDY

K Jones. *Leeds Teaching Hospital Trust, Leeds, UK*

Progress to full bottle feeding often determines timing of discharge. This small-scale randomised controlled trial tested the hypothesis that healthy, stable preterm infants fed in an elevated side-lying position progress to full oral feeds at the same rate as infants fed in the more traditional semi-upright position.

Eleven healthy preterm infants were randomly allocated to one of the two feeding positions and studied until full oral feeds were achieved. The mean total number of days to full oral feeds in those in the elevated side-lying position (range 14–27 days, mean 20.8 days) did not differ from those fed in the semi-upright position