

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

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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 toxemia (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

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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

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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

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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.

(range 10–33 days, mean 19 days, $p > 0.05$). The rate at which the side-lying group achieved three, four or five feeds per day was, however, more rapid than the rate seen in the semi-upright group.

Side-lying was well accepted by both parents and nursing staff. This pilot study will inform the design of further necessary research to examine the potential benefits of this approach to an important and common problem.

PN.02 A DEVELOPMENT IN SCOTTISH QUALIFICATION AND CREDIT FRAMEWORK LEVEL 10 NEONATAL NURSING EDUCATION IN SCOTLAND: INNOVATION AND COLLABORATION

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Two reports recommended a structured career pathway for neonatal nurses with appropriate educational provision in Scotland.^{1, 2} An identified deficit in the provision of intermediate neonatal nursing education (SCQF level 10) was addressed by the NHS Education Board for Scotland tendering a project. Napier University and Glasgow Caledonian University in conjunction with Robert Gordon University, NHS Lothian, NHS Greater Glasgow and Clyde and NHS Grampian were awarded the tender to deliver a suite of three modules.

These modules are: (1) A double integrated theory and practice module (40 level 10 credits)—Higher Level Knowledge and Skills for Neonatal Nursing. The module content focusses on the theoretical basis of specific systems, neonatal problems and conditions with opportunities to develop related practice in the neonatal intensive care setting. (2) A single module (20 level 10 credits)—Specialised Aspects of Neonatal Care, offering generic theory on subjects such as legal and ethical principles, leadership, research, working with parents and multidisciplinary team working. (3) A single module (20 level 10 credits)—Neonatal Resuscitation, Stabilisation and Transport will bring together standardised, neonatal-specific Continuing Professional Development education already available from local providers.

The ultimate aim of these modules would be to enable existing experienced neonatal nurses to achieve a Graduate Certificate in Neonatal Nursing Practice (60 level credits), which is a unique award in Scotland. These three modules are delivered across two sites at Napier University and Glasgow Caledonian University on a rotational programme.

1. **Scottish Neonatal Nurses Group (SNNG).** Report on Neonatal Nurse Staffing and Career Pathways. Unpublished. 2004.
2. **Scottish Neonatal Nurses Group (SNNG).** The Competency Framework and Core Clinical Skills for Neonatal Nurses. Unpublished. 2005.

PN.03 KANGAROO MOTHER CARE AND ITS EFFECTS ON PARENTING STRESS AND MATERNAL POSTNATAL ATTACHMENT IN CASES OF PREMATURE BIRTH

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This study investigates the impact of the kangaroo mother care (KMC) intervention for premature infants on mother–infant bonding.

Participants: 44 premature infants and their mothers were examined: 21 dyads in KMC and 23 in traditional care (TC).

Procedure: The KMC infants received daily skin-to-skin contact for a minimum of 1 h a day, for 14 days after birth. Maternal psychological data were collected twice: after delivery (time 1) and 2 weeks after the infant's discharge (time 2). Tests administered

were: Maternal Postnatal Attachment Questionnaire (MPAQ), Neonatal Perception Inventory (NPI), Parental Stress Index Short Form (PSI-SF), Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI) and Gordon-Personal Profile Inventory (GPP-I) (time 1 only).

Results: At time 1, some baseline characteristics between the intervention and the control group were significantly different with regard to gestational age at birth (more preterm in the KMC group), days in intensive care (more days in the KMC group) and mothers' BDI score (higher in the TC group). All of these were considered as covariates in the statistical analysis. At time 2, KMC mothers were less rejective (MPAQ) towards their infants ($F(1, 42) 9.56$; $p = 0.004$) and less preoccupied (NPI) in caring for their infants ($F(1, 42) 5.06$; $p = 0.031$) than TC mothers. The parenting stress level changed between times 1 and 2: TC mothers only experienced a significant increase from time 1 (mean 42.77) to time 2 (49.27) ($F(1, 22) 7.570$; $p < 0.01$).

BMFMS: Pregnancy Outcome

PPO.01 STILLBIRTHS: HAVE THINGS CHANGED OVER A DECADE?

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The stillbirth rate has remained stable nationally at 5/1000 births since the 1990s. We aimed to investigate in detail the causes and associations of stillbirths in two cohorts, 10 years apart to determine whether there has been any reduction in the prevalence of potentially preventable stillbirths.

Methods: Information on stillbirths occurring in Liverpool Women's NHS Foundation Trust between 1995–7 and 2004–6 was collected from perinatal mortality reports, birth registers and an electronic database (Meditech). ReCoDe, placental histology and birthweight centiles were used to examine further the unexplained groups. Results were analyzed using Stats Direct.

Results: We investigated 269 stillbirths. Maternal age and proportion of primiparous women were similar in both cohorts. More than 50% of stillbirths in both groups are classified as unexplained by CEMACH. There is no significant change in the prevalence of fetal growth restriction babies in the unexplained groups over these years (see table).

Conclusions: Despite progression in obstetric services, there is no change in all causes of stillbirths. 41% of unexplained stillbirths may have been prevented if we identified methods to diagnose fetal growth restriction and predict which of these babies are at risk of stillbirth. This could impact on decreasing stillbirth rates in the next decade.

Abstract PPO.01

Causes of stillbirths	1995–7	2004–6	p Value
	N = 117 (%) SB rate 6.6	N = 152 (%) SB rate 6.3	
Abruption	19 (16.2)	20 (13.2)	0.2945
Fetal abnormality	21 (17.9)	34 (22.4)	0.2307
Infection	4 (3.4)	2 (1.3)	0.2285
Maternal disorder	2 (1.7)	5 (3.3)	0.3440
Other specific causes	5 (4.3)	6 (3.9)	0.5646
Unexplained <2500 g	44 (37.6)	46 (30.3)	0.1282
FGR	19 (43.2)	28 (60.9)	0.0708
Unexplained >2500 g	22 (18.8)	39 (25.7)	0.1178
FGR	7 (31.8)	7 (17.9)	0.1783

FGR, fetal growth restriction; SB, stillbirth.