

1. TEENAGE PREGNANCY — THE OBSTETRIC CONSEQUENCES IN A COASTAL REGION

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To retrospectively analyse the obstetric outcome of teenage pregnancy compared with the non-teenage population in 2000 at Waterford Regional Hospital.

Method: Data were manually collected from the birth register held at Waterford Regional Hospital. Comparative analysis between the obstetric outcome of teenage and non-teenage pregnancies considered the following: the demography of the age and parity of the two female populations, the gestational age, birthweight and mode of delivery of the baby.

Results: There were 118 births to teenage mothers out of a total of 1,809 mothers (6.5%) at Waterford Regional Hospital in 2000. Five (4.2%) of these 118 mothers were aged 15 or younger; 23/118 (19%) were aged 16-17 years. The index pregnancy was born to a nulliparous teenage mother in 109 cases (92.2%). This compares with 1,009 cases (56%) of the non-teenage population.

As regards risk of premature delivery, 8% (n=9) of teenage mothers delivered at less than 37 weeks, compared with 7% (n=124) of the rest of the population. The risk of low birthweight was similar at 6% (n=7) compared with 7% (n=121) in the non-teenage population. Very low birthweights were rare in both groups: 3% (n=3) in teenage mothers compared with 2% (n=34) in the non-teenage group. There was one neonatal death in the teenage mothers group.

The mode of delivery enquiry revealed differences in the instrumental delivery rate of 13% (n=15) in the teenage group compared with 8% (n=146) for the rest of the population. Furthermore, there was an overall decreased risk of Caesarean section of 13% (n=15) compared with 26% (n=467) as seen in teenage populations in Ireland and the UK.

Further sub-analysis of the mode of delivery compared nulliparous teenagers with the rest of the nulliparous mothers carrying a singleton pregnancy. The instrumental delivery rate was lower at 13.8% (n=15) compared with 17.5% (n=118/673) for non-teenage nulliparous women with a singleton pregnancy. The Caesarean section rate was only 12.8% (n=14) for teenagers compared with 31.2% (n=210/673) for non-teenagers. Expressed as a risk of Caesarean section in a teenager, the odds ratio (OR) was 0.36 (95% CI: 0.20-0.65) compared with non-teenage mothers.

Discussion: Pregnant teenagers constitute a significant proportion of the antenatal population: 6.5% at Waterford Regional Hospital. From analysis of those teenagers who delivered during 2000, it is important to note the risk of premature delivery of 8% and, of statistical significance, their decreased risk of having a Caesarean section.

2. HOW EFFECTIVE IS AMNIOTOMY AS A TOOL OF INDUCTION?

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To assess the effectiveness of amniotomy or artificial rupture of membranes (ARM) as a tool of induction.

Methods: This study comprises a prospective record of 3,586 cases of amniotomy for induction of labour in the National Maternity Hospital between July 1996 and December 1999. A 24-

hour interval following amniotomy was observed, allowing for the spontaneous onset of labour. Oxytocin was used if labour did not ensue within 24 hours. All women in whom the membranes were ruptured for more than 18 hours received prophylactic antibiotics. All data were retrieved from the delivery suite computerised records on all deliveries, which are updated and reviewed by a senior midwife daily.

Results: A total of 26,670 women delivered in the National Maternity Hospital during the study period. Of these, 3,586 women underwent amniotomy only for induction of labour; 2,259 (63%) were multiparous and 1,327 (37%) were primiparous. A total of 90.1% of the women who underwent amniotomy laboured spontaneously within 24 hours. Oxytocin as an induction agent was employed in <10% of cases following amniotomy. Overall, 80.5% of the women had a spontaneous delivery, 7.3% had a ventouse delivery, 4.3% had a forceps delivery and 7.9% underwent a Caesarean section. A total of 90.5% of the multipara women had a spontaneous vaginal delivery compared with almost 63.4% of their primiparous counterparts. Some 4.6% of multipara and 23.5% of primipara women required instrumental delivery, with 13.1% of all primipara and 4.9% of multipara women having a Caesarean section. There was a statistically significant difference (p<0.001) in the amniotomy-to-delivery interval between multipara and primipara women. Overall, 6.9% required antibiotics in labour, either for prolonged rupture of membranes or pyrexia. A total of 4.8% (n=173) of infants were admitted to the Special Care Baby Unit. The perinatal mortality rate in the study group was 2.7 per 1,000.

Conclusions: Amniotomy is a safe, effective and cheap method of induction and is safe for both mother and baby.

3. DELIVERY WITHIN 30 MINUTES — IS THIS AN ACHIEVABLE STANDARD?

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To audit the decision-to-delivery interval for women undergoing emergency lower segment Caesarean section (LSCS) in order to determine if there is compliance with the Royal College of Obstetrician and Gynaecologists (RCOG) recommendation of 30 minutes.¹

Methods: All deliveries by emergency LSCS for a three-month period in two hospitals were examined. The decision-to-delivery interval was calculated. The interval was analysed separately for each indication for LSCS.

Results: The mean decision-to-delivery interval for each hospital was 38 and 50 minutes, respectively. The RCOG recommended time of 30 minutes was exceeded in 32% of deliveries. The use of general anaesthesia was significantly different in those who were delivered within 30 minutes compared with those who were not in the unit with the shortest mean time.

Conclusions: The RCOG recommended decision-to-delivery interval for emergency LSCS is exceeded in 32% of cases. There may be an increase in the use of general anaesthesia in order to comply with the RCOG recommendations. This may increase maternal exposure to hazardous conditions. Delivery by emergency LSCS within 30 minutes may not be an achievable or safe standard for delivery.

Reference:

1. Full Clinical Guideline on the Use of Electronic Fetal Monitoring. Royal College of Obstetricians and Gynaecologists, London 2000.

4. AUDIT OF DECISION-TO-DELIVERY INTERVAL FOR EMERGENCY CAESAREAN SECTIONS FROM DELIVERY WARD

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It has been recommended that the decision-to-delivery interval for emergency Caesarean sections should not be greater than 30 minutes. However, the validity of these recommendations has been questioned.

Aims: To audit the decision-to-delivery interval for patients from delivery ward who were delivered by emergency Caesarean section, to investigate the reasons for any delay and to assess any potential effect on neonatal outcome.

Method: The charts of 200 consecutive patients delivered by emergency Caesarean section from delivery ward between 1 January 2001 and 31 May 2001 were retrospectively reviewed. The indication for Caesarean section, decision-to-delivery interval, transfer time from delivery ward to theatre, anaesthesia-to-delivery time, reasons for delay and neonatal outcome were recorded.

Indication	N (%)
Failure to advance	102 (51)
Foetal distress	64 (32)
Abruption/placenta previa	7 (3.5)
Cord prolapse	8 (4)
Other	19 (9.5)

	Average (minutes)	Urgent Caesarean section (minutes)	Less urgent Caesarian section (minutes)
Decision-to-delivery interval	41.9 (6-121)	29.3 (6-70)	49.5 (20-121)
Transfer time	17.5 (2-82)	11.0 (2-50)	26.9 (5-82)
Anaesthesia-to-delivery time	15.5 (3-55)	12.7 (3-30)	15.6 (4-55)

Reason	N (%)
Anaesthetic delay	40 (27.9)
Delay in transfer	35 (24.5)
Theatre busy	7 (4.9)
Registrar busy	5 (3.5)
Not documented	56 (39.2)

Results: These 200 patients represent 6.1% of the total number of patients delivered during this period (n=3264). The overall Caesarean section rate was 15.2% (n=497). The age, parity and gestational age were similar to the patient population of the hospital. The indications for Caesarean section are shown in Table 1. The average decision-to-delivery interval was 41.9 minutes. This was directly related to the urgency of the Caesarean section and the transfer and anaesthesia-to-delivery time (Table 2). While only 28.5% (n=57) of patients were delivered within 30 minutes, 56% (n=112) were delivered within 40 minutes. Transfer times may reflect an already occupied theatre and obstetrician, rather than true delay (as shown in Table 3). There was no difference in admissions to the Special Care Baby Unit in those babies delivered after 30 minutes.

Conclusions: In this study, the recommended decision-to-delivery interval of 30 minutes was achieved in only 28.5% of patients. Delay beyond 30 minutes did not affect the neonatal outcome. The authors also question the validity of this 30-minute recommendation.

5. THE EFFECT OF A STRESS REDUCTION INTERVENTION ON PARENTAL STRESS AND ANXIETY IN THE NICU: A RANDOMISED, CONTROLLED TRIAL

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A difficult or debilitating delivery that results in an infant's admission to a neonatal intensive care unit (NICU) can cause acute stress and anxiety for the new parents. In addition, the highly technical environment of the NICU can overwhelm parents and increase their perception that their baby is abnormal or vulnerable. The aim of this study was to measure stress and anxiety levels in parents whose infants were admitted to the NICU, and assess the effectiveness of a stress reduction intervention for parents.

Methods: The instruments selected were the previously validated Parental Stressor Scale:NICU (PSS:NICU) to measure parental stress and the State-Trait Anxiety Inventory (STAI) to measure parental anxiety, by researcher-administered questionnaires. Four dimensions of stress were measured: (a) altered parental role; (b) sights and sounds of the NICU; (c) infant appearance and behaviour; and (d) staff communication and behaviour. A cluster sample (n=80) of the parents of infants admitted to the NICU, stratified into a control group (n=40) and an intervention group (n=40), were selected from three NICUs in Cork city. A stress reduction intervention, consisting of a researcher-administered information booklet, was administered to the intervention group. Standard care and communication was given to the control group. Stress and anxiety levels were compared for the two groups.

Results: Stress and anxiety scores were found to be higher for mothers than for fathers. The dimension of altered parental role was identified as the highest source of stress for both parents, with staff communication and behaviour being the least stressful. The use of the information booklet reduced stress levels in mothers in the intervention group compared with the control group, notably in the dimensions of altered parental role, sights and sounds, and infant's appearance and behaviour. The fathers' stress and anxiety scores were not impacted by the application of the intervention.

Conclusions: The researcher-administered information booklet reduced maternal stress levels but not anxiety levels. Paternal stress and anxiety were lower than maternal levels and were unaffected by the intervention. In general, the father concentrated on the mother's coping ability while the mother remained focused on the welfare of the baby.

6. ERB'S PALSY: PREVALENCE PREDICTION AND MANAGEMENT

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The pathogenesis of Erb's palsy is poorly understood. Factors such as macrosomia and shoulder dystocia are causally implicated. The Irish Erb's Palsy Association (founded in 1998) has to date collected data on 144 cases with residual disability. Poor communication by professionals regarding prognosis and management is a recurring criticism. An associated expressive language disorder has been noted in a proportion of these children.

Objective: This study was undertaken to find out if antecedent risk factors are present that would help identify babies at risk of Erb's palsy.



Methods: During the 50 months from December 1993 to January 1998, 38,274 infants were delivered at the National Maternity Hospital; of these, 54 (1.4 per 1,000) sustained a brachial plexus injury (BPI). The obstetric details of their mothers were compared with 108 controls, selected as the next two vaginal deliveries matched for maternal and gestational age, parity and birthweight. All 162 partographs were reviewed individually by three senior obstetricians blinded to neonatal outcome, who were asked to identify the likely BPI cases. A scoring system was assigned to include mode of delivery, maternal booking and pre-delivery weight and weight gain >20kg, previous infant birthweight >4kg, previous shoulder dystocia, first stage arrest >2 hours at >6cm cervical dilatation and second stage >3 hours in primiparae or >2 hours in multiparae, giving a maximum possible score of 8.

Results: Partographic assessment identified likely BPI in 13/54 (24%) cases and 16/108 (15%) controls, with only 3/54 (69%) BPI cases predicted by all three obstetricians (PPV 7-17%, NPV 5-12%; sensitivity 24-50%, specificity 66-68%). Seven out of 54 cases had a poor recovery, with two requiring surgery. The highest prediction score recorded was 5/8 in six cases, two BPI and four controls. Although a trend towards higher scores was apparent in BPI cases, this was of no value in clinical decision making in individual cases.

Conclusions: (a) Erb's palsy is an important national problem. (b) The incidence in this study is 1.4/1,000. (c) Fifteen per cent of cases have a long term disability. (d) BPI cannot be reliably predicted during labour, which has medico-legal implications. (e) Resources must concentrate on optimum management of shoulder dystocia, early physiotherapy assessment and prognostic indicators, with neurological and surgical intervention to be considered when recovery has not taken place after three months.

7. SPONTANEOUS PUBERTY AND PREGNANCY IN IRISH GIRLS WITH TURNER SYNDROME

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Turner syndrome (TS) is a common chromosomal disorder, affecting 1:2,000 live born females. Stanhope et al reported that over 90% of TS individuals have gonadal failure and over 99% are infertile. Some 10-20% of TS individuals have spontaneous pubertal development and 2-5% have spontaneous menses. Hormonal treatment of growth and ovarian failure, together with *in vitro* fertilisation, have improved the prospects for the growth and sexual development of patients with TS.

The aims of this study were to review the pattern of puberty development and the hormonal profile of a cohort of Irish girls with TS attending the National Children's Hospital in Dublin.

Sixty-five girls with TS were reviewed, of whom 42 were >12 years old. Eight patients were pre-pubertal (19%); 17 girls (40%) had induced puberty. Spontaneous puberty occurred in 17 girls (40%), of whom only nine had menarche. The mean age of spontaneous puberty was 13.9 years (10.9-18.9; SD 1.7). Only one girl had a successful pregnancy and delivery. The LHRH stimulation test was performed in all patients. Peak oestradiol >200 was seen in six patients only.

The authors conclude that a significant number of the girls with TS in this cohort have achieved spontaneous puberty. The authors recommend that hormonal induction of feminisation should be initiated in a manner that simulates normal growth and pubertal development.

8. NEAR-MISS MATERNAL MORTALITY

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Maternal mortality audit has traditionally provided a 'yardstick' for the measurement of the quality of maternal healthcare. Maternal mortality is fortunately rare and lessons learned from such rare events may not be applicable to the general obstetric population. For this reason, there is increasing interest in the audit of severe maternal morbidity and 'near-miss' maternal mortality. The aim of this study was to determine the incidence and the causes of near-miss maternal mortality in an Irish obstetric population.

Methods: Near-miss maternal mortality, as classified by Mantel et al (*British Journal of Obstetrics and Gynaecology* 1998), was prospectively audited at the Coombe Women's Hospital from January 1999 to October 2001 inclusive.

Results: A total of 52 of 21,170 women delivering over this study period fulfilled the criteria. The overall incidence of severe morbidity and near-miss mortality was 0.245%. Women were included in the audit for the following reasons.

Near-miss maternal mortality	Number of cases
Haemorrhage requiring >5 RCC units	31
Postpartum and Caesarean hysterectomy	7
Eclampsia	8
Failed intubation	2
Acute fatty liver of pregnancy	1
Amniotic fluid embolism	1
Diabetic ketoacidosis	1
Respiratory failure	1

Conclusions: Almost 1.2 in every 500 women have a life-threatening complication in pregnancy. Most of these events are attributable to haemorrhage and are managed in the maternity hospital setting. Management outside of these parameters occurs in selected cases. Audit regarding transfer to an ICU, while useful, does not accurately identify the spectrum of severe maternal morbidity. The use of broader indications, such as the criteria outlined in this study, should help in the development of preventative strategies and assist in the planning of health resources.

9. EVALUATION OF BABIES BORN AT TERM WITH BIRTHWEIGHTS GREATER THAN THE 95TH PERCENTILE

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To evaluate the intrapartum and postnatal outcome in babies born at term with birthweights greater than the 95th percentile (4.3kg)

Methods: All deliveries of infants born with a birthweight greater than or equal to 4.3kg were identified from the delivery register for a six month period (July - Dec 2000). The mode of delivery, neonatal outcome and accuracy of antenatal detection of macrosomia were examined.

Results: Eighty-one babies were born with a birthweight of >4.3kg (5.7%) in the time specified. In 25% of cases the maternal booking weight was >80kg. The majority of deliveries (38%) occurred in women who were para one. There were two gestational diabetics in total. Macrosomia was suspected in 37% antenatally. Spontaneous labour occurred in 38%. Spontaneous vaginal delivery occurred in 54%, instrumental delivery in 22% and delivery by LSCS in 24%. There were eight neonatal admissions to SCBU. Trauma to



the neonate manifest as shoulder dystocia occurred in eight babies (10%). This represented 42% of all babies born with shoulder dystocia in that time. The most frequent maternal complication was postpartum haemorrhage, which occurred in 22.2% of women. There were no maternal third degree tears.

Conclusions: Macrosomic babies are detected poorly antenatally. The most reliable predictive factor is clinical suspicion or a maternal booking weight in excess of 80kg. Although the rate of spontaneous vaginal delivery is less than the population as a whole, maternal complications are relatively infrequent. Trauma to the neonate occurs in 10%, the most common adverse event being shoulder dystocia.

10. CANNABINOIDS AND THE HUMAN UTERUS DURING PREGNANCY

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The cannabinoids are best known for their psychoactive properties in humans. However, *in vitro* studies have shown that they also have potent smooth muscle relaxant effects in gastrointestinal tract and vascular tissue. Smooth muscle relaxation is thought to be mediated by these compounds via stimulation of the cannabinoid type I (CB1) receptor. There are no data documenting the potential uterine effects of endogenous or exogenous cannabinoids in either human or animal myometrium.

Objectives: (1) To investigate the potential uterine effect of the cannabinoids anandamide, CP 55940 and ACEA on human pregnant myometrium. (2) To determine whether myometrial effects of cannabinoid compounds are mediated by stimulation of the CB1 receptor.

Methods: Human myometrial biopsies were obtained at elective Caesarean section. Tissue was mounted for isometric recording under physiological conditions in Krebs-Henseleit solution. Cumulative doses of the endogenous cannabinoid ANAN (CB₁, CB₂ agonist) and the exogenous cannabinoids CP 55940 (CB₁, CB₂ agonist) and ACEA (selective CB₁ agonist) were added at bath concentrations in the range 1nmol/l to 100µmol/l. Cross antagonism of the effects of the three compounds on uterine contractility was investigated using the known potent selective CB₁ antagonist, SR 141716 (1µM). Contractile responses were measured by calculation of the integral for 20 minutes using the PowerLab hardware unit and Chart v4.0 software. The pD₂ (-log₁₀EC₅₀) value and the mean maximum inhibitory value (MMI) were used to compare compounds.

Results: All three cannabinoid compounds had a significant uterorelaxant effect on human pregnant myometrium. The selective CB₁ antagonist SR 141716 produced a significant rightward shift in the dose-response curves for ANAN (pD₂=5.61±0.43 vs 2.98±0.16, p=0.01; MMI=24.25±2.2 vs 61.61±2.1, p=0.01), CP 55940 (pD₂=4.67±0.64 vs 1.46±0.52, p=0.01; MMI=40.14±4.14 vs 68.93±3.88, p=0.01) and ACEA (pD₂=6.49±0.19 vs 3.98±0.29, p=0.05; MMI=8.88±3.52 vs 51.8±6.5, p=0.01). Values are expressed as mean±SEM.

Discussion: This study shows that endogenous and exogenous cannabinoids exert a potent relaxant effect on human uterine smooth muscle during pregnancy. These findings are consistent with previous animal studies that have shown that expression of the endogenous cannabinoid anandamide is increased during pregnancy and that expression of anandamide hydrolase, its major degradative enzyme, is decreased. The authors' results highlight the novel finding that endogenous cannabinoids may play a role in the maintenance of uterine quiescence during human pregnancy, and in relation to labour, term and preterm.

11. A STUDY OF FATTY ACID ABSORPTION, DIGESTION AND METABOLISM IN THE PRETERM INFANT

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Long chain polyunsaturated fatty acids (LCPs) are an integral part of cell membranes and of the developing central nervous system (CNS). Of particular interest is docosahexaenoic acid (DHA), which constitutes 30-40% of the fatty acids in cell membranes of the CNS. DHA is the metabolite of the essential fatty acid α-linolenic acid (ALNA). All preterm formulas are now supplemented with LCPs because of evidence of developmental advantages;¹ however, little is known about how well these LCPs are absorbed from the gut or their subsequent metabolism.

Methods: Seven infants ranging in age from 30 to 37 weeks gestation were given 20mg/kg of uniformly labelled ¹³C ALNA with a feed of SMA low birthweight formula. Blood samples (1ml) were taken at t=0, 6, 24, 72 and 168 hours. Lipid extraction was performed on both plasma and red blood cells prior to transportation to the University of Southampton for gas chromatography isotope ratio mass spectrometry (GC-IRMS). Stool samples were then collected for five days and frozen at -20°C. Breath samples were collected hourly from t=0-6 hours and at 8, 10 and 24 hours. A Deltatrac II metabolic monitor was used to measure the CO₂ production between breath samples. Stool and breath samples were also transported to the University of Southampton for analysis of ¹³C content and ¹³CO₂.

Results:

Table 1. Patient characteristics and breath results

Infant	1	2	3	4	5	6	7
Weight (g)	1,120	1,700	1,680	1,760	1,700	1,800	1,290
Gestation (weeks)	30	35	34	37	32	34	30
% ¹³ C on breath	12.9	24	3.7	20.3	13.8	17.1	23.1

Stool results available on Infants 1 and 2 show 7.3% and 3.3% of original doses of ¹³C remaining unabsorbed.

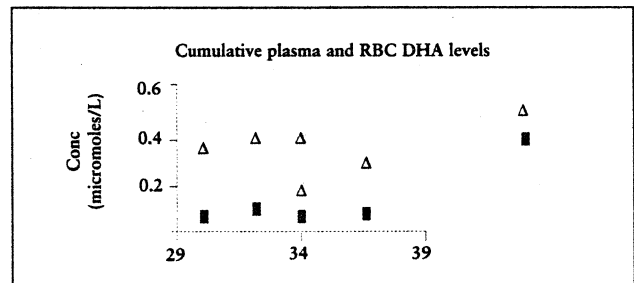


Figure 1. DHA levels in plasma and red blood cell phospholipids (Infants 3-7)

Conclusions: (1) Stool results show absorption in excess of 90% in the two infants analysed to date. The authors' previous work using labelled tripalmitin (the most common fat in milk) showed absorption of 70-90%, emphasising the importance of LCPs to the preterm neonate. (2) Analysis of breath showed that Infants 1-7 retained between 76 and 87.1% of the ingested ¹³C in body pools. This again



represents a greater degree of oxidation than the authors' have seen with tripalmitin. (3) Maturity does not appear to affect the amount of labelled DHA in plasma or red cell phospholipid between 30 and 37 weeks. This may indicate that excess DHA has been deposited in the tissues or that this range of gestation does not alter the infant's ability to synthesise DHA. Further recruitment is necessary to confirm the above findings.

References:

1. Simmer K. Long chain polyunsaturated fatty acid supplementation in preterm infants (Cochrane Review). In: The Cochrane Library, Issue 4, 2000. Oxford: Update Software.
2. Mitchell DJ et al. Serial studies of the gastrointestinal handling of ¹³C labelled tripalmitin in preterm infants. *Proc Nutr Soc* 2001; 60: 31A.

12. MATERNAL ANTI-HYPERTENSIVE THERAPY AND THE FETO-PLACENTAL CIRCULATION

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Hypertensive disorders of pregnancy occur as a complication in 7-10% of all pregnancies and constitute a leading cause of maternal and perinatal morbidity and mortality. Most antihypertensive drugs cross the placental barrier. Their potential effects on the fetoplacental circulation have been questioned but there are minimal data on this topic. The aim of this study was to investigate and compare the direct effects of the antihypertensives labetalol, hydralazine, alpha-methyldopa and nifedipine on human umbilical artery resistance *in vitro* in uncomplicated pregnancies.

Methods: Umbilical artery samples were obtained immediately after delivery from 30 women at term. Dissected arterial rings were suspended under physiological conditions for isometric recording using the PowerLab hardware and Chart version 4.0 software. The *in vitro* effects of labetalol, hydralazine, alpha-methyldopa and nifedipine (at concentration ranges 10⁻⁹ to 10⁻³M) and the effects of respective vehicle controls on umbilical artery resistance were measured. The results were analysed using ANOVA followed by post hoc testing with the Newman Keuls test. Curves were fitted using the logistic equation and the package GraphPad Prism

Results: All antihypertensive compounds, except alpha-methyldopa, exerted a significant vasorelaxant effect on human umbilical artery (p<0.0001). Mean maximal inhibition and pD₂ values, corrected allowing for control measurements, for the dose-response curves are shown in Table 1. The order of potency was nifedipine>hydralazine and labetalol>alpha-methyldopa.

Drug added	Mean maximal inhibition	pD ₂
Alpha-methyldopa	20.89±7.99	
Hydralazine	71.97±4.80	3.26±0.07
Labetalol	63.15±8.70	3.10±0.09
Nifedipine	84.12±3.84* (p<0.05)	5.82±0.34*

Conclusion: These findings clearly demonstrate that the commonly used antihypertensive agents, except for alpha-methyldopa, have significant effects on the fetoplacental circulation. Nifedipine exerts the most potent effects. These results have implications for the clinical use of these agents.

13. THIRTY-YEAR TRENDS IN AN IRISH OBSTETRIC POPULATION

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In order to reflect socioeconomic changes in Irish society since the 1960s, the authors have evaluated sequential trends in respect of parity, maternal age, gestation at delivery and birthweight in a large cohort of the national birth total during the period 1968-1998.

Methods: The authors undertook a retrospective review of obstetric variables in six biennial cohorts at six yearly intervals, derived from the annual clinical reports of the National Maternity Hospital (NMH), Dublin. Where feasible, comparisons have been made with national data.

Results: During the 30-year period, total NMH births varied between 11 and 14% of the national total. The proportion of primigravidae and grandmultiparae have increased and decreased, respectively. There has been a shift in predominant childbearing age from the 25-29 cohort to the 30-34 cohort. The proportion of teenage pregnancies has altered very little, but births to women over 40 years have declined sharply. Births outside marriage have increased from 5 to 29%. There has been a trend towards increasing birthweight, but no increase in infants exceeding 4.5kg. The total number of infants weighing under 1.5kg has more than doubled. National birth statistics generally reflected NMH trends, but with an apparent time lag.

Conclusion: At both national and institutional levels, there is a trend towards later childbearing, lower parity and a greater proportion of primigravidae in the annual birth cohort. The NMH proportion of total Irish deliveries continues to increase.

14. IRISH NEONATAL MORTALITY — 13 YEARS ON

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This study aims to define the exact cause of neonatal mortality in Ireland for 2000 and to compare these figures with those for 1987, 1998 and 1999.

Methods: All paediatric and maternity units in Ireland were contacted by post through the Faculty of Paediatrics in the College of Physicians, Ireland. Paediatricians were requested to fill in a questionnaire which dealt with data pertaining to all live-born infants >500g who died within the first 28 days of life. Initial notification took place in April 2001, with two subsequent notifications by post between April and September 2001. Data were entered into an access database. In an effort to maximise confidentiality regarding the hospital of origin of each infant, each hospital and infant was given a unique identification number prior to computer entry. Deaths were categorised as lethal malformation, prematurity, asphyxia and 'specific'. Results were compared with those previously published by Counahan and Clarke for 1987, by Dempsey and Gormally for 1998 and by Foran and Gormally for 1999.

Results: Twenty-two of the 28 centres replied, giving a response rate of 79%. The overall number of neonatal deaths for 2000 was 194 compared with 310 for 1987, 209 for 1998 and 186 for 1999. A total of 116 infants (59.7%) weighed <1500g and 92 (47.4%) weighed <1000g. A total of 143 (73.7%) infants died within seven days of birth. The principal causes of death were congenital malformations (48.9%; n=95), prematurity (35%; n=68) and



asphyxia (8.7%; n=17). This compares to figures of 39%, 35% and 8% for 1987, 44%, 34% and 5% for 1998 and 39%, 37% and 2.1% for 1999, respectively. The overall number of births for 2000 was 54,239 compared with 53,354 for 1999. The overall neonatal mortality rate for 2000 was 3.57/1,000 with a corrected neonatal mortality rate of 1.8/1,000. The neonatal mortality rate and corrected neonatal mortality rate for 1987 were 5.3/1,000 and 3.3/1,000, for 1998 were 3.9/1,000 and 2.2/1,000 and for 1999 were 3.48/1,000 and 2.1/1,000, respectively.

Conclusions: (1) The overall neonatal mortality rates – both total and corrected – have improved in the last 12 years and figures are similar for the last two years. (2) Postmortem rates are still very low – 27.3% for 2000 compared with 24% for 1999. (3) Antenatal steroid uptake remains sub-optimal at 14.9% compared with 20% for 1999. (4) The incidence of term asphyxial deaths has increased from 2.1% in 1999 to 7.7% in 2000, after decreased rates were shown in 1998 and 1999 compared with 1987.

15. CARDIAC TAMPONADE AND HYDROTHORAX ASSOCIATED WITH THERMOSENSITIVE POLYURETHANE CATHETER USE

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Central venous catheters are almost commonplace in the nutritional management of preterm infants. Extravasation of parenteral nutrition is a serious and potentially lethal complication which, although well documented, occurs infrequently.

The authors report two cases of cardiac tamponade and one case of hydrothorax which occurred whilst using the relatively new polyurethane catheters in preterm infants. All three cases occurred because of transmigration of the catheter. One case of cardiac tamponade did not survive. The other cases are alive and well.

The modern polyurethane central venous catheters are stiffer at insertion compared with the Silastic central venous catheters. The newer modern polyurethane catheters are meant to soften as they warm. The authors' concern is that this stiffness may be a factor that predisposes these catheters to transmigration, and thus result in an increased risk of problems with extravasation.

16. SOMATIC MOSAICISM FOR INCONTINENTIA PIGMENTI IN A NORMAL KARYOTYPE MALE INFANT

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Incontinentia pigmenti (IP) is a rare dermatogenesis characterised by cutaneous, dental, ocular and neurological abnormalities. This condition is seen almost exclusively in females, as it is segregated as an X-linked dominant trait and is usually lethal in males.

The disease has been linked to Xq28 and approximately 80% of patients with IP have a deletion of exon 4 through to exon 10 of the NEMO gene, which is central to many immune, inflammatory and apoptotic pathways. Few affected males have been previously reported; however, the majority of these individuals have a 47 XXY karyotype.

The authors present a case of IP in a normal karyotype healthy male infant. He was born at term, appropriate for gestational age, of Romanian parents with no relevant family history. He presented at day three of life with a blistering lesion on the medial aspect of his right leg. Extensive viral

evaluation was normal. He was referred at four weeks of age with recurrence of the rash, again blistering, but now clearly demarcated in a hyper-pigmented linear pattern down the medial aspect of the right leg in the lines of Blascho. The clinical diagnosis of IP was confirmed by PCR analysis of DNA from a skin biopsy sample revealing a deletion of the NEMO gene on Xq28.

The exceptional nature of this case is that the male infant has not only survived but also remains neurologically normal. This is most likely due to the fact that he exhibits mosaicism for the NEMO gene deletion in his somatic cell lines, a finding reported in only a small number of males.

17. HYPERNATRAEMIC DEHYDRATION IN A BREAST-FED INFANT BORN AT HOME

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A normal infant weighing 3.6kg was born by normal delivery at term at home to a primigravida mother aged 34 years. She was breast-fed from birth with support from the community midwife services. She was referred to the breast-feeding support clinic aged four days with excessive weight loss. At this time, supplementation of expressed breast milk or formula was advised. A follow up appointment was arranged which was not attended. When telephoned, the mother informed the team that feeding had improved and a further appointment was made.

She returned for review aged 12 days. The mother had not given supplemental feeds as advised. At this time, the infant weighed 2.83kg. On examination she was mildly lethargic. Her temperature was 35.5°C but vitals were otherwise normal. Examination was otherwise unremarkable.

Investigations revealed hypernatraemic dehydration with a serum sodium of 171 and a urea of 21.6. Full blood count revealed a haemoglobin of 23.9g/dl with a haematocrit of 0.71. She was appropriately rehydrated over 48 hours. She had a normal neurological examination and a cranial ultrasound was normal. She was discharged aged 16 days on breast feeds and formula supplements.

Discussion: Despite the well-known advantages of breast-feeding to both mother and baby, there are potentially detrimental complications such as hypernatraemic dehydration. Close monitoring of babies' weight in the first week is advocated by the American Academy of Paediatrics, especially for breast-fed firstborns. Greater resources are required to support breast-feeding mothers who deliver at home or are discharged early from hospital. Difficulties can occur where parents who are highly motivated towards breast-feeding do not follow professional advice.

18. A SURVEY OF INFERTILITY PRACTICES IN PRIMARY CARE IN THE SOUTHERN HEALTH BOARD

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About one in six couples suffer from infertility problems at some time in their lives. There are many different causes of infertility and people are often faced with a confusing variety of treatments, technical jargon, clinical visits, statistical possibilities and worrying financial decisions. The object of this study was to investigate current practices in general practice as regards history taking, examination, investigation and referral of patients presenting with infertility.

Methods: A questionnaire with 10 closed questions was developed and mailed to 399 general practitioners (GPs) in the Southern Health Board area (Cork and Kerry), to determine the extent of history taking,



examination, investigation and point of referral to specialist units. In addition, GPs were asked to rank 12 statements that have been suggested as criteria for good quality care in the management of infertility in general practice in the UK according to a Likert scale.

Results: The response rate was 61% (242/399). Responders' reported practices are described in Table 1. Agreement with the suggested criteria are summarised as follows:

The following are 12 suggested criteria for good quality care in the management of infertility in general practice in the UK. The number in brackets following each statement indicates the percentage of responders' who agreed or strongly agreed with the statement.

1. The presence of amenorrhoea, oligomenorrhoea and a history of pelvic pathology, or abnormal findings on examination of either partner should result in early referral to a specialist clinic (98%).
2. The female partner should be advised to take folic acid supplements while attempting to become pregnant (98%).
3. A full medical, social and sexual history of both partners should be obtained (97%).
4. The investigation of infertility should include both partners from the outset (93%).
5. The female partner's rubella status should be checked (89%).
6. There should be local guidelines for the investigation, management and referral of infertile patients (88%).
7. A pelvic exam of the female, a genital exam of the male and a general exam of both partners should be performed (85%).
8. The initial investigation of the male should include two seminal analyses at least one month apart (83%).
9. A day 21 progesterone level should be the basic investigation of ovulation in the regularly menstruating female (83%).
10. Treatment of anovulation with clomiphene should always be initiated by a specialist hospital clinic rather than in general practice (61%).
11. Temperature charts are only of limited use and couples should be discouraged from using them (31%).
12. There are no other biochemical or hormonal investigations of the female partner that are relevant in general practice (8%).

Conclusion: The high response rate suggests that infertility is an area of interest to GPs. The survey has highlighted simple changes that could improve care in general practice and bring practice into line with the evidence and expressed opinion of GPs. Infertility guidelines have been shown to improve the process of care, and support for those appear to be strong. The availability of evidence-based guidelines may stimulate appropriate changes in practice.

Table 1. Responders' reported practices

Full medical history of female	99%
Full medical history of male	83%
History and examination of female	91%
History and examination of male	75%
Internal examination of female	55%
Genital examination of male	71%
Hormone levels of female	93%
Seminal analysis of male	85%
Initiate infertility treatment	22%

19. FOETAL CARDIAC TROPONIN 1 IN RELATION TO INTRAPARTUM EVENTS AND UMBILICAL ARTERY pH

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This prospective observational study aimed to measure foetal cardiac

tropoin 1 in umbilical artery, and in relation to intrapartum events and umbilical artery pH. The study was conducted at University College Hospital Galway. The main outcome measure was umbilical artery serum cardiac troponin 1.

Methods: Umbilical cord artery samples were obtained after delivery from 110 infants and serum cardiac troponin 1 was measured, as previously reported.¹ The onset of spontaneous labour (n=46), induction of labour (n=31), elective Caesarean section (n=32), spontaneous vaginal delivery (n=51), emergency Caesarean section in labour (n=7), instrumental delivery (n=20), the presence of meconium staining of the liquor (n=19) and umbilical artery pH (n=95) were all examined in relation to serum foetal cardiac troponin 1.

Results: The median cardiac troponin 1 level was 0.03ng/ml (range 0.03-0.881). No relation with gestational age was found. Similarly, with multiple regression, the following parameters displayed no relation with foetal troponin 1 levels: parity, presence of labour, meconium staining of the liquor, mode of delivery, birthweight and Apgar scores. Twelve neonates had a level considered above normal (>0.05ng/ml). When compared to those neonates with a level of 0.03ng/ml (n=84), the umbilical artery pH was lower: 7.24 (SD 0.09) versus 7.32 (SD 0.07), respectively; p=0.005. No other differences between these two groups were found; in particular, mode of delivery and duration of labour were similar.

Conclusion: Foetal serum cardiac troponin 1 shows little variation at birth, with 76% of this group recording a level of 0.03ng/ml. Increased levels of cardiac troponin 1 is associated with a lower umbilical artery pH, suggesting an interplay between foetal acidosis and myocardial damage.

Reference:

1. Fleming SM, O'Gorman T, Finn J et al. Cardiac troponin 1 in pre-eclampsia and gestational hypertension. *Br J Obstet Gynaecol* 2000; 107: 1417-20.

20. FOLIC ACID SUPPLEMENTATION: HAVE WE IMPROVED IN THREE YEARS?

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To establish if there was any improvement in uptake of folic acid preconceptionally from 1998 to 2001. To determine whether three years of television advertising has made any difference.

Methods: An anonymous questionnaire was distributed prospectively to 200 women attending the antenatal clinic in Altnagelvin Area Hospital. This was a similar questionnaire to one used in 1998. The questions were simple and answered easily by ticking boxes. They included age range, parity, whether the pregnancy was planned, awareness of the benefits of folic acid, source of knowledge and whether folic acid supplementation was commenced before or during pregnancy.

Results: Information from 1998 and 2001 was compared. In 1998, 51% of the pregnancies studied were 'planned'; this rose to 58.5% in 2001. Some 73% of women were aware of the benefits of folic acid prior to becoming pregnant in 1998, which increased to 93% after becoming pregnant. In 2001, 91% of women were aware of the benefits of folic acid preconception, which increased to 99.5% after becoming pregnant. In 1998, 44.5% of women claimed to be aware of the benefits of folic acid and had a planned pregnancy; 31.5% of these women commenced folic acid after becoming pregnant. In 2001, 58% of women claimed to have been aware of the benefits of folic acid and had a planned pregnancy and 47.4% of these women commenced folic acid after becoming pregnant. This figure was further divided: 58.1% of these women commenced folic acid after they



missed a period and 41.8% commenced folic acid after a consultation with their GP or midwife.

Overall, in 2001, in both the planned and the unplanned pregnancy groups, 32% of women took folic acid preconception (31.5% in 1998), 31% commenced folic acid after they missed their period and 30% of women commenced folic acid after a consultation with their GP or midwife. In 1998, 11% of women did not take folic acid at all and this decreased to 7.5% in 2001.

The main source of information changed from books/magazines in 1998 to midwives in 2001. Television as a source of information about folic acid increased from 3% in 1998 to 14% in 2001. In 2001, 41% of women in the planned pregnancy group indicated television to be a source of information. Of these women, 52% took folic acid before becoming pregnant, 29% commenced it after missing a period and 19% commenced it after seeing their GP or midwife. Some 42% of women in the unplanned pregnancy group indicated television to be their source of information; however, 14% of these women did not take folic acid at all, 46% took it after they missed their period and 40% waited until they saw their GP or midwife.

Conclusions: Folic acid consumption pre-pregnancy remains a difficult issue to address. Even though the number of planned pregnancies rose by 7.5%, the number of women taking folic acid preconception remained relatively unchanged. This is remarkable as 91% of women surveyed in 2001 claimed to be aware of the benefits of folic acid prior to becoming pregnant. It is also interesting to note when some women start taking folic acid after discovering they are pregnant: 40% of women did not commence folic acid until after they saw their GP or midwife. For all of these women, the benefit of folic acid consumption is minimal.

The Government's television campaign, which commenced just prior to the first study in 1998, seems to have made no difference to folic acid uptake, even though more women considered it as a source of information in 2001.

Personal interviews with the respondents showed complacency to be a common issue, and most women, while aware of the potential problems, did not feel personally at risk. Several women were more interested in getting a scan picture than in discussing folic acid.

How can we further address this problem? Food supplementation is an option and perhaps more information should be given when prescribing contraception, especially emergency contraception. However, the extensive Government advertising campaign and information given by GPs and midwives have made no difference to uptake over the last three years.

21. DIABETES IN PREGNANCY: AN AUDIT OF DEMOGRAPHICS, MANAGEMENT AND OUTCOME AND THE IMPACT OF A COMBINED MANAGEMENT APPROACH

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In light of RCOG, WHO and forthcoming CREST guidelines in the management of diabetes in pregnancy, the authors undertook to audit the number and outcome of diabetic pregnancies in the Ulster and Ards Hospitals. The audit was conducted for a six-year period of deliveries from January 1995 to December 2000. The authors aimed to identify if there has been any improvement in outcome since developing a combined endocrine antenatal clinic.

Most organisations suggest that pregnancies complicated by diabetes (in order to try to achieve St Vincent's Declaration) should be managed at a combined endocrine/antenatal clinic. Pregnancies should be planned and patients given specific

preconceptional advice. It is advised that (especially for insulin-dependent [IDDM] patients) periconceptional diabetic control should be rigorous and that early booking be facilitated. Pregnancies should be cautiously monitored on a 'hospital care' basis and any complications should be managed appropriately. Anomaly scanning and foetal assessment should be available. Diabetic control should be monitored and serial HbA1Cs checked and maintained at a level <8.0. Insulin should be used in sufficient dosages (in a 'physiological' manner) to maintain normoglycaemia. Non insulin-dependent diabetics (NIDDM) should be converted to insulin once pregnancy is established. Maternal complications directly attributable to diabetes should be actively excluded or treated. Perinatal morbidity and mortality should be monitored and outcomes audited. The RCOG suggests regional audits.

Method: Pregnancies complicated by diabetes were identified using the NIMATS system and the Endocrinology Combined Clinic records. Patient medical/endocrine notes, antenatal notes and neonatal notes (where relevant) were reviewed. A proforma was completed for each patient and results compiled in a SPSS database. The total number of identified pregnancies attending the antenatal clinic was 55.

Results: Patients were classified into IDDM, NIDDM and gestational diabetics GDM, either requiring or not requiring insulin. There was a steady increase in diabetic pregnancies attending the clinic, especially after the development of a combined approach, and most pregnant patients with diabetes attended the combined clinic. Younger patients tended to have IDDM, whereas patients who were older or had a higher body mass index tended towards NIDDM or GDM. Most patients did not have diabetic complications, but there was a significant number with concomitant medical conditions.

Booking was generally initiated from the primary healthcare team and was usually earlier for IDDM pregnancies. Most patients had documented evidence of pre-pregnancy advice, usually by the diabetic clinic, and the majority used glucometer monitoring. HbA1C level tended to decrease with advancing pregnancy and insulin levels used rose accordingly. There was a greater decrease in HbA1C after the introduction of the combined approach.

A total of 76% of all pregnancies in the series had at least one obstetric complication with pre-eclampsia and pre-term labour and delivery being seen much more frequently than in the general population. There was a much greater chance of pregnancy intervention and instrumentation, and 57% had abdominal delivery. Extremes of infant delivery weight were also seen, with a much higher risk of macrosomia and also low birthweight secondary to premature delivery. Some 83% of infants required admission to the neonatal unit and 5% transfer to regional units. Neonatal morbidity and mortality was higher than the general perinatal population.

Conclusions: The authors conclude that the number of diabetic pregnancies is increasing and that there is a recent increase in the proportion of pregnant women with NIDDM. There is a tendency to NIDDM and GDM in older women and in obese women. A high proportion of diabetic women have other significant medical complications. Insulin requirements of IDDM increase as pregnancy progresses and, in general, there is an improvement in glucose control during pregnancy. This has further improved since the development of the combined clinic. IDDM pregnancies tend to have more complications than NIDDM and GDM pregnancies and have a higher risk of premature delivery. More than 50% of diabetic women deliver by Caesarean section. Significant numbers of infants of diabetic mothers are admitted to the special care baby unit; however, in general their stay there is short. Most common problems are as expected – hypoglycaemia, hyperbilirubinaemia, hypocalcaemia and feeding difficulties. There is still a high perinatal mortality and malformation rate compared with non-diabetic pregnancies.



**22. NEONATAL TRANSPORT —
A NEW BEGINNING IN IRELAND**

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The transfer of sick and premature infants to a tertiary centre requires specialised personnel, equipment and management. The authors reviewed neonatal transfer in Ireland over the first six months of the initiation of the National Neonatal Transport Programme in March 2001 and analysed some of the problems.

Methods: The case records of neonatal transfers from March 2001 to September 2001 were retrospectively reviewed. Gestational age, birth weight, day of transfer, reason for transfer, destination, mobilisation time, transport time, ventilatory requirement, inotropic support and use of Prostin were recorded and analysed.

Results: Eighty-five infants were transported: 38 (44.7%) within Dublin and 47 (55%) from peripheral hospitals. Mean birthweight was 1.84kg (0.51-4.32), mean gestation 32 weeks (24-41), mean day of transfer 18.2 days (<24 hours to 159 days), mean mobilisation time 30 minutes (10-90) and mean transport time 5.65 hours (1-11.5). Infants ventilated on transfer were 70 (82.35%), on oxygen only 7 (8.23%), on dopamine 9 (10.5%) and on Prostin 7 (8.23%).

Reason for transfer	n (%)
Cardiac (including PDA)	32 (38)
GIT/NEC	17 (20)
RDS	15 (17.6)
CNS	7 (8.23)
PFC	5 (5.88)
Other congenital defects	5 (5.88)
Metabolic	2 (2.35)
Bronchoscopy	2 (2.35)

Examples of problems during transfer:

Case 1. Baby A, aged 28 weeks, had RDS, coagulopathy, bleeding from mouth and nose pulmonary haemorrhage. Baby A was on dopamine and dexamethasone, morphine and antibiotics. Patient was transferred for ENT evaluation. Transfer was safe. The receiving hospital had no bed on arrival. Thus, the transport team had to remain until the infant had bronchoscopy and the echo was completed and then return to the referring hospital. This delayed another patient transfer for three hours.

Case 2. Baby B, aged 41 weeks, with RDS/PFC, was ventilated on 100% oxygen, on dopamine, Prostin, morphine and antibiotics. During transfer, the infant's condition deteriorated; oxygen saturation decreased to 60%. Prostin dose increased and the infant improved. The infant arrived at the neonatal ICU, was seen by a consultant and was transferred to Our Lady's Hospital for Sick Children, Crumlin. Echo showed TGA; an operation was performed and the baby is well.

Case 3. Baby C, aged 37 weeks, with maternal polyhydramnios, went home on day three and was admitted on day four in collapsed state with vomiting and abdominal distension. The infant was resuscitated with saline bolus, FFP and blood, was transferred to a surgical unit and ventilated on 60% oxygen at a saturation of 85-90%. Following transfer to bed, the baby became bradycardic <60/minute, needed adrenaline (two doses) and atropine IV and CPR for six minutes. Laparotomy was performed and perforation of stomach was found. Baby C died after two days.

Conclusion: The most common diagnosis in transferred infants is cardiac problems. A major problem is finding a bed for the patient. This is the responsibility of the referring paediatrician and needs to be addressed nationally. There is a need for audit of neonatal transfers and of pre-transfer management; a structure needs to be developed for this.

**23. THE IMPACT OF A NEW REFUGEE POPULATION
ON A REGIONAL NICU**

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The current figure of those holding refugee status in Ireland is over 35,000. Currently, in the North Eastern Health Board region, the total number of asylum seekers is 1,693. This has had a significant impact on both maternity and paediatric services in the region. To date, little information is available on the degree of that impact on either service.

Aims: To audit the neonatal population born to asylum seekers that was admitted to a regional neonatal intensive care unit (NICU). To perform a costing analysis based on the number of bed days occupied by the population being studied.

Method: As part of an audit on all NICU admissions in Our Lady of Lourdes Hospital, Drogheda, information was entered on all infants of asylum seekers admitted to the NICU from January 2000 to September 2001. Demographic data included sex, gestation, birthweight, mode of delivery, diagnosis, ventilation days, duration of antibiotic therapy, phototherapy, total parenteral nutrition and length of stay in the NICU. Maternal data included hepatitis B, syphilis and HIV status, in addition to sickle cell carrier status.

A costing analysis was subsequently performed based on the number of days spent in the NICU and the number of ventilator days. Two groups were analysed, those for 2000 and those for 2001.

Results: Seventy-three neonates of refugee mothers were admitted to the NICU over the 20-month period. This accounted for 2.9% and 14% of admissions for 2000 and 2001, respectively.

The mean gestational age was 37.425±3.452 weeks with a mean birthweight of 2,949±833.6g and a male-to-female ratio of 1:1. The principle diagnoses included prematurity (n=23), respiratory distress (n=13), of which six cases had respiratory distress syndrome and seven cases had transient tachypnoea of the newborn. Other principle diagnoses included infection (n=12), prolonged rupture of membranes (n=9) and meconium aspiration syndrome (n=7). The average length of stay was 8.7±11.2 days (range 1-70 days). There were 32 ventilator days and 78 TPN days. The overall cost based on bed days within the NICU was €187,128.

Conclusion: In the past year in the North Eastern Health Board region, there has been a significant increase in the workload in the authors' regional NICU. Several different factors have been implicated. One of the contributing factors has been the increase in the number of asylum seekers since the opening of the Mosney Camp in December 2000. This audit reveals the financial impact of this occurrence on a regional NICU.

**24. ELECTRICAL IMPEDANCE – A NOVEL APPROACH
TO DETERMINE FOETAL LUNG MATURITY**

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Objective: To assess foetal lung maturity using electrical impedance measurements of amniotic fluid and to compare these results with standard tests (lecithin-sphingomyelin [LS] ratio and bubble test).

Study design: A total of 132 women who underwent amniocentesis to estimate foetal lung maturity in Groote Schuur Hospital, Cape Town, gave written informed consent for a 5ml sample of liquor to be analysed in the study. Eighty-five samples of immature



liquor were obtained from the Department of Genetics, University of Leeds, following diagnostic second trimester testing for genetic disorders. Electrical impedance measurements on both sets of samples were obtained by placing tetrapolar probes into the aliquots of amniotic fluid. A current of 10µA was passed between two poles with the resultant potential being measured between the remaining two poles. In addition, all samples had a bubble test performed. The Cape Town samples also had LS ratios performed.

Results: Statistically significant correlations were noted at the 0.01 level when comparing electrical impedance measurements with gestational age and the bubble test. The correlation between electrical impedance measurements and the LS ratio was significant at the 0.05 level. The correlations were seen with both the 5mm and the 8mm probes.

Discussion: This preliminary *in vitro* study demonstrates a potential ability for electrical impedance measurements of amniotic fluid to aid the determination of foetal lung maturity. However, the technology is complex and relatively expensive in the underdeveloped and developing worlds setting, where amniocentesis for foetal lung maturity is commonly performed. Future work needs to explore the possibility of applying this technology to the *in vivo* setting in order to avoid amniocentesis.

25. GASTROSCHISIS/OMPHALOCOELE: PREVALENCE AND ASSOCIATED RISK FACTORS IN THE IRISH POPULATION

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A rising incidence of gastroschisis has been highlighted in several literature reports. The aetiology of gastroschisis is unknown. There is a consistent relationship between its occurrence and young maternal age. Factors such as smoking, recreational drugs and alcohol use have been variably associated with gastroschisis.

Objective: This retrospective case review study aims to describe the prevalence of gastroschisis and to identify whether substance abuse is a significant associated factor in babies born with gastroschisis at the Coombe Women's Hospital, Dublin. It was conducted over a 12-year period (1990 to October 2001). All known cases of gastroschisis /omphalocoele identified from ultrasound, surgical records and hospital database were used in the study.

Results: There were 21 cases of gastroschisis and three of omphalocoele. The mean maternal age was 23 years (range 16-30 years). Eighteen (75%) women were ≤24 years and six (25%) were between 25 and 30 years. Nineteen (79%) were single and five (21%) were married. Sixteen (67%) were primigravida and eight (33%) were multigravida. Seventeen (71%) were unemployed and seven (29%) were employed. Six (25%) of the cases were referred from peripheral hospitals and the remaining 18 (75%) were booked at the Coombe Women's Hospital. All 21 women with affected babies smoked more than 10 cigarettes per day and 11 (46%) smoked more than 20 per day. Ten (42%) women ingested more than six units of alcohol per day. Fourteen (58%) women have used one or more of the following recreational drugs: ecstasy, cocaine, heroin, cannabis, marijuana and rohypnol. There was a geographical variation in the incidence of gastroschisis, with mothers resident in one city zone accounting for more than 30% of cases.

Conclusions: This study (in keeping with other studies) has shown a strong relationship between gastroschisis and young maternal age. Alcohol and recreational drug use was common in women with affected babies and all of the mothers smoked. These findings are consistent with other similar studies. In contrast, the three infants with omphalocoele were born to mothers who did not use alcohol/drugs or smoke cigarettes.

26. CHORIOAMNIONITIS AND INCREASED MATRIX METALLOPROTEINASE-8 LEVELS IN BRONCHOALVEOLAR LAVAGE FLUID FROM PRETERM BABIES AT RISK OF DEVELOPING CHRONIC LUNG DISEASE

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Chorioamnionitis is an important risk factor for the development of neonatal chronic lung disease (CLD). The mechanisms for inflammation leading to lung injury are not fully elucidated in the preterm baby. The authors' previous studies have demonstrated increased levels of matrix metalloproteinase-8 (MMP-8), a type-I collagenase, in bronchoalveolar lavage (BAL) fluid samples taken within the first week of life from preterm babies who subsequently developed CLD.

Aim: To determine the effect of chorioamnionitis on BAL fluid MMP-8 levels taken from ventilated preterm babies within the first week of life.

Methods: MMP-8 levels were measured by an ELISA in 100 BAL samples taken during the first six postnatal days from 45 ventilated preterm infants <34 weeks' gestation. The median MMP-8 value for each baby was calculated. Chorioamnionitis was defined histologically as inflammatory cells present in the chorionic plate.

Results: Six of the 45 babies had chorioamnionitis confirmed histologically. There were no differences in birthweight between the chorioamnionitis and the non-chorioamnionitis group. Median MMP-8 levels in the first six days of life were higher in the chorioamnionitis group than the non-chorioamnionitis group: 43.5 (12.5-50.8) ng/ml versus 4.6 (0-12) ng/ml; p=0.004. Thirty-seven of the 45 mothers had received antenatal corticosteroids and 19 of them had a completed course (12mg betamethasone x 2 >24 hours prior to birth). No significant differences in BAL fluid MMP-8 levels were found between the full steroid, partial steroid and non-steroid treated groups (5.1ng/ml vs 5.5 ng/ml vs 6.2 ng/ml, respectively).

Conclusions: The authors have demonstrated higher MMP-8 levels in the BAL fluid of babies from pregnancies complicated by chorioamnionitis. Increased MMP-8 activity may predispose to lung injury as a prelude to CLD by disrupting lung extracellular matrix. No effects of antenatal steroid administration on lung inflammation were found.

27. NEONATAL PERITONEAL DIALYSIS: FIVE-YEAR EXPERIENCE IN A REGIONAL CENTRE

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Continuous peritoneal dialysis for the treatment of acute renal failure in neonates has been advocated over the last 10 years, but limited information is available on its efficacy. The aims of this study were as follows: first, to describe the profile of neonates being dialysed, the duration and complications of their treatment, associated co-morbidities and outcome; and second, to determine appropriate pre-dialysis investigation.

Methods: The charts of all neonates having peritoneal dialysis from March 1996 to March 2001 were examined for gestation, birthweight, mode of delivery, Apgar scores, pre-dialysis assessment, age at which dialysis was commenced, duration of dialysis, complications, co-morbidities and outcome.

Results: Nineteen neonates were referred for a nephrology opinion



regarding dialysis. Reasons for not having dialysis were extremely poor prognosis (n=3), necrotizing enterocolitis (n=2), anorectal abnormality (n=1) and the presence of an ileostomy (n=1).

Twelve neonates were subsequently dialysed. Indications for dialysis were hyperkalaemia (n=3), fluid overload with oligo/anuria (n=2), fluid overload secondary to hydrops (n=2), hyperammonaemia (n=1), persistent acidosis (n=2) and anuria secondary to bilateral renal vein thrombosis (n=1) and renal fungal balls (n=1).

Pre-dialysis cranial ultrasound scans (USs) were performed in 11 of the dialysed patients. Three were abnormal and eight were normal. Two babies who had normal USs prior to dialysis subsequently developed cystic periventricular leucomalacia. Renal USs was normal in three patients.

Median (range) gestation was 29.5 (23-41.14) weeks and birthweight 1.77 (0.537-3.4) kg. Nine neonates were preterm, three weighing <1kg. Three had evidence of foetal distress (presence of meconium [n=2], reversed Dopplers on US [n=1] and cord pH of 7.0 [n=1]). Median (range) Apgar score at one minute was 5 (2-8) and at five minutes was 7 (4-9). One baby had severe neonatal encephalopathy (Sarnat stage 2).

All patients were treated with peritoneal dialysis. The median (range) age of onset of dialysis was 6.5 (1-109) days. Very preterm babies had a later onset of dialysis. Median (range) duration of dialysis was 3 (1-231) days.

Eight babies had complications including catheter blockage (n=4), leakage (n=2) and peritonitis (n=3). Six required one or more catheter replacements.

Nine (75%) babies died, seven in the neonatal intensive care unit (NICU) and two post-discharge. Of those that died in the NICU, the median (range) age at death was 27 (6-59) days. Of the three survivors, one required long-term dialysis but all were developmentally delayed.

Conclusion: Peritoneal dialysis is being used more frequently in neonates to give a chance of life, even in the very preterm, extremely low birthweight baby. Although it is effective in the short-term management of renal failure and metabolic disorders, the morbidity and mortality are very high. This is related to the underlying diagnosis and co-morbidity that is often associated with multiple organ failure.

28. CORTICOSTEROIDS AND FOETAL VASCULATURE: EFFECTS OF HYDROCORTISONE, DEXAMETHASONE AND BETAMETHASONE ON HUMAN UMBILICAL ARTERY

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Antenatal corticosteroid treatment is indicated for women at risk of preterm delivery. However, recent research has focused on the potential adverse effects of such treatment, especially in relation to multiple doses. Adverse foetal cardiovascular effects, such as reduction in foetal heart rate variability and alterations in umbilical artery Doppler waveforms, have been reported, but the mechanism of these effects is unknown. Current theories have focused on the possibility of placental release of vasodilatory compounds induced by exogenous corticosteroids. The aim of this study was to investigate the direct effects of the corticosteroids hydrocortisone, dexamethasone and betamethasone on human umbilical artery resistance *in vitro*.

Methods: Umbilical artery samples were obtained immediately after delivery from 48 women at term. Dissected arterial rings were suspended under physiological conditions for isometric recording using the PowerLab hardware and Chart version 4.0 software. The *in vitro* effects of hydrocortisone, dexamethasone and betamethasone (at concentration ranges 10^{-9} to 10^{-4} M) and the effects of respective

vehicle controls on umbilical artery resistance were measured. The results were analysed using a 3x2 ANOVA followed by post hoc testing with the Newman Keuls test.

Results: Both endogenous and exogenous corticosteroids exerted a potent vasodilatory effect on human umbilical artery resistance ($p < 0.0001$). In comparison to vehicle control experiments, hydrocortisone exerted a vasodilatory effect on human umbilical artery at all concentrations studied ($p < 0.0001$). The mean net relaxant effect of hydrocortisone ranged from 11.7% (10^{-9} M) to 54.1% (10^{-4} M). Both exogenous compounds, dexamethasone and betamethasone, similarly exerted a significant relaxant effect on human umbilical artery tone ($p < 0.05-0.01$) in comparison to vehicle control experiments. The mean net relaxant effect of dexamethasone ranged from 14.8% (10^{-9} M) to 36.8% (10^{-4} M) in a cumulatively increasing fashion. The mean net relaxant effect of betamethasone ranged from 7.9% (10^{-9} M) to 39.1% (10^{-4} M).

Conclusion: This paper clearly demonstrates the novel finding that corticosteroids exert a direct and potent vasodilatory effect on human umbilical artery resistance *in vitro*. This provides an explanation for the previously unexplained vascular effects associated with antenatal administration of corticosteroids. These findings raise further questions about the clinical practice of prescribing a multiple course of antenatal corticosteroids.

29. COMPARISON OF MATERNAL SATISFACTION FOLLOWING VAGINAL DELIVERY AND CAESAREAN SECTION

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This prospective questionnaire-based study aimed to examine: (i) women's level of satisfaction with vaginal birth after Caesarean section compared with women after Caesarean section who had previously experienced vaginal delivery, and (ii) to assess the reasons why an increasing proportion of women request Caesarean delivery on their second pregnancy. The study was conducted at the National Maternity Hospital, Dublin.

Methods: A cohort of 52 women who had undergone first vaginal birth after previous Caesarean (VBAC) were compared with 52 women after Caesarean section following previous vaginal delivery (CSAVD) using a structured questionnaire. This was self-administered during the early puerperium (day 2-3).

Main outcome measures: Women's satisfaction with the management of the index pregnancy and labour, including pain relief and obstetric outcome, and their preferences for future deliveries. Retrospective questioning was used with respect to the previous delivery.

Results: The vast majority of the women in both groups were satisfied with their mode of delivery (90% in VBAC vs 94% in CSAVD). Using an analogue score, 77% of the VBAC group scored 8/10 or more. Both groups were satisfied with their overall experience in the labour ward /operating theatre (83% vs 81%). The VBAC group had minimal pain post-delivery. Twelve (23%) CSAVD were delivered under general anaesthesia. Both cohorts were generally satisfied with their pre-delivery information, although the VBAC group felt better prepared for their mode of delivery (79% vs 40%).

Fourteen (27%) of the VBAC group had initially opted for a repeat Caesarean section, but were content with a trial of vaginal delivery; 6/14 had previously undergone antepartum Caesarean section. However, 5/14 (36%) were dissatisfied with their VBAC outcome and would opt for a future Caesarean section. The reasons for dissatisfaction included the physical stress of their labours and the adequacy of analgesia. Two of the dissatisfied five had previously undergone



pre-labour Caesarean sections.

Six (11.5%) of the CSAVD group had initially opted for a Caesarean section before mode of delivery was decided. Three of the six hoped for a subsequent vaginal birth.

Conclusion: A large majority of women questioned during the early puerperium who have undergone Caesarean and vaginal modes of delivery would prefer vaginal birth for future pregnancies. Reasons for dissatisfaction with vaginal birth related to adequacy of analgesia and the physical stress of labour. Perceptions may alter at reassessment after a longer interval following delivery.

30. QUANTIFICATION OF FOETAL DNA IN THE PERIPHERAL BLOOD OF WOMEN WITH PRE-ECLAMPSIA

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Foetal trafficking refers to the phenomenon where whole cells, namely foetal erythrocytes, leucocytes, placental trophoblasts and, more recently, free foetal DNA have been found in the maternal peripheral circulation during normal pregnancy. Pre-eclampsia is a disease specific to pregnancy that is associated with significant perinatal and maternal morbidity and mortality. Increased foetal trafficking of erythrocytes, trophoblast and syncytiotrophoblast vesicles has been described in pre-eclampsia.

Aims: The purpose of this research was to study foetal trafficking in pre-eclampsia using a genetic marker that is specific to the foetoplacental unit, i.e. the SRY gene in a pregnant woman carrying a male foetus. The aim of this study was to determine if the quantity of foetal DNA is increased in the blood of women with pre-eclampsia compared to normal pregnant controls.

Methods: Thirty-two women with pre-eclampsia and 32 gestational age-matched controls were recruited for the study. DNA was extracted from 200ml of blood and real time quantitative PCR analysis was used to determine the amount of foetal DNA (SRY) and total DNA (β -actin) in each sample. The ratio of foetal to total DNA was calculated. Data from women with pre-eclampsia were compared to data from controls using the paired t-test for parametric data and the Mann-Whitney U test for non-parametric data. A p-value <0.05 was considered to be statistically significant.

	Pre-eclampsia	Controls	p-value
Number	32	32	
Age (years)	28.7 \pm 1.0	24.9 \pm 0.9	0.0013*
Parity	0.81 \pm 0.18	0.84 \pm 0.22	NS
Booking DBP	69.8 \pm 2	67.7 \pm 1.33	NS
DBP at sampling	100.9 \pm 1.7	69.4 \pm 0.98	<0.0001*
Gestation at sampling	31.86 \pm 0.79	32.5 \pm 0.84	NS
Gestation at delivery	33.3 \pm 0.79	39.3 \pm 0.32	<0.0001*
Birthweight (g)	1982.5 \pm 170.1	3350.8 \pm 91	<0.0001*

Results: The clinical characteristics of the study and control groups are shown in Table 1.

The ratio of foetal to total DNA was increased significantly in women with pre-eclampsia (mean and standard error=4.63 \pm 3.16) compared with controls (1.17 \pm 1.06); p<0.05.

Conclusion: Foetal trafficking as determined by quantitation of the SRY gene in maternal blood is increased in pre-eclampsia.

